PRIMERGY MX130 S2 Server

Upgrade and Maintenance Manual

Edition November 2011

Comments… Suggestions… Corrections…

The User Documentation Department would like to know your opinion of this manual. Your feedback helps us optimize our documentation to suit your individual needs.

Feel free to send us your comments by e-mail to manuals@ts.fujitsu.com.

Certified documentation
according to DIN EN ISO 9001:2008

To ensure a consistently high quality standard and user-friendliness, this documentation was created to meet the regulations of a quality management system which complies with the requirements of the standard DIN EN ISO 9001:2008.

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Before reading this manual

For your safety

This manual contains important information for safely and correctly using this product.

Carefully read the manual before using this product. Pay particular attention to the accompanying manual "Safety Notes and Regulations" and ensure these safety notes are understood before using the product. Keep this manual and the manual "Safety Notes and Regulations" in a safe place for easy reference while using this product.

Radio interference

This product is a "Class A" ITE (Information Technology Equipment). In a domestic environment this product may cause radio interference, in which case the user may be required to take appropriate measures.   VCCI-A

Aluminum electrolytic capacitors

The aluminum electrolytic capacitors used in the product's printed circuit board assemblies and in the mouse and keyboard are limited-life components. Use of these components beyond their operating life may result in electrolyte leakage or depletion, potentially causing emission of foul odor or smoke.

As a guideline, in a normal office environment (25°C) operating life is not expected to be reached within the maintenance support period (5 years). However, operating life may be reached more quickly if, for example, the product is used in a hot environment. The customer shall bear the cost of replacing replaceable components which have exceeded their operating life. Note that these are only guidelines, and do not constitute a guarantee of trouble-free operation during the maintenance support period.

High safety use

This product has been designed and manufactured for general uses such as general office use, personal use, domestic use and normal industrial use. It has not been designed or manufactured for uses which demand an extremely high level of safety and carry a direct and serious risk to life or body if such safety cannot be ensured.

These uses include control of nuclear reactions in nuclear power plants, automatic airplane flight control, air traffic control, traffic control in mass transport systems, medical devices for life support, and missile guidance control in weapons systems (hereafter, "high safety use"). Customers should not use this product for high safety use unless measures are in place for ensuring the level of safety demanded of such use. Please consult the sales staff of Fujitsu if intending to use this product for high safety use.

Measures against momentary voltage drop

This product may be affected by a momentary voltage drop in the power supply caused by lightning. To prevent a momentary voltage drop, use of an AC uninterruptible power supply is recommended.

(This notice follows the guidelines of Voltage Dip Immunity of Personal Computer issued by JEITA, the Japan Electronics and Information Technology Industries Association.)

Technology controlled by the Foreign Exchange and Foreign Trade Control Law of Japan

Documents produced by Fujitsu may contain technology controlled by the Foreign Exchange and Foreign Trade Control Law of Japan. Documents which contain such technology should not be exported from Japan or transferred to non-residents of Japan without first obtaining authorization in accordance with the above law.

Harmonic Current Standards

This product conforms to harmonic current standard JIS C 61000-3-2.

Only for the Japanese market: About SATA hard disk drives

The SATA version of this server supports hard disk drives with SATA / BC-SATA storage interfaces. Please note that the usage and operation conditions differ depending on the type of hard disk drive used.

Please refer to the following internet address for further information on the usage and operation conditions of each available type of hard disk drive:

http://primeserver.fujitsu.com/primergy/harddisk/

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Version history

Issue number	Reason for update
	Initial release

1   Introduction

This Upgrade and Maintenance Manual provides instructions for the following procedures:

● Upgrading the server configuration by adding optional hardware components

● Upgrading the server configuration by replacing existing hardware components with superior ones.

● Replacing defective hardware components

CAUTION!

The document at hand comprises procedures of a wide range of complexity. Check the profile of qualification for technicians before assigning tasks. Before you start, carefully read "Classification of procedures" on page 23.

1.1   Where to find which information?

While the Upgrade and Maintenance Manual focuses on upgrade and maintenance procedures to bring the server back to normal operation, additional manuals provide detailed background information on server components and BIOS settings.

For information on documents you need to have with you when leaving for maintaining a server see "Documents you need at hand" on page 28.

> **i** PRIMERGY manuals are available in PDF format on the ServerView Suite DVD 2. The ServerView Suite DVD 2 is part of the ServerView Suite supplied with every server.
>
> If you no longer have the ServerView Suite DVDs, you can obtain the relevant current versions using the order number U15000-C289 (the order number for the Japanese market: please refer to the configurator of the server *http://primeserver.fujitsu.com/primergy/system/*).
>
> The PDF files of the manuals can also be downloaded free of charge from the Internet. The overview page showing the online documentation available on the Internet can be found using the URL (for EMEA market): *http://manuals.ts.fujitsu.com*. The PRIMERGY server documentation can be accessed using the *Industry standard servers* navigation option.
>
> For the Japanese market:
>
> Please refer to the following URL for the latest product manuals: *http://primeserver.fujitsu.com/primergy/manual/*
>
> Before using the product, please check for additional information that may be available under the following URL: *http://primeserver.fujitsu.com/primergy/products/note/*

1.2   Notational conventions

The following notational conventions are used in this manual:

Text in italics	indicates commands or menu items
`fixed font`	indicates system output
`semi-bold fixed font`	indicates text to be entered by the user
"Quotation marks"	indicate names of chapters and terms that are being emphasized
►	describes activities that must be performed in the order shown
Abc	indicates keys on the keyboard
⚠ **CAUTION!**	Pay particular attention to texts marked with this symbol! Failure to observe this warning may endanger your life, destroy the system or lead to the loss of data.
ℹ	indicates additional information, notes and tips
🔧 🔧 🔧	indicates the procedure category in terms of complexity and qualification requirements, see "Classification of procedures" on page 23
🕐	indicates the average task duration, see "Average task duration" on page 26

2 Before you start

Before you start any upgrade or maintenance task, please proceed as follows:

► Carefully read the safety instructions in chapter "Important information" on page 31.

► Make sure that all necessary manuals are available. Refer to the documentation overview in section "Documents you need at hand" on page 28. Print the PDF files if required.

► Make yourself familiar with the procedure categories introduced in section "Classification of procedures" on page 23.

► Ensure that all required tools are available according to section "Tools you need at hand" on page 27.

Installing optional components

The "PRIMERGY MX130 S2 Server Operating manual" gives an introduction to server features and provides an overview of available hardware options.

Use the Fujitsu ServerView Suite management software to prepare hardware expansions. ServerView Suite documentation is available online at *http://manuals.ts.fujitsu.com* (*http://primeserver.fujitsu.com/primergy/system/* (for the Japanese market) or from the ServerView Suite DVD 2 supplied with your PRIMERGY server. Please refer to the following ServerView Suite topics:

– Operation
– Virtualization
– Maintenance

> **i** For the latest information on hardware options, refer to your server's hardware configurator available online at the following address:
>
> for the EMEA market:
> *http://ts.fujitsu.com/products/standard_servers/micro_server/primergy_mx130 s2x.html*
>
> for the Japanese market:
> *http://primeserver.fujitsu.com/primergy/system/*

Before you start

Please contact your local Fujitsu customer service partner for details on how to order expansion kits or spare parts. Use the Fujitsu Illustrated Spares Catalog to identify the required spare part and obtain technical data and order information. Illustrated Spares catalogs are available online at *http://manuals.ts.fujitsu.com/illustrated_spares* (EMEA market only).

2.1 Classification of procedures

The complexity of maintenance procedures varies significantly. Procedures have been assigned to one of three unit categories, indicating the level of difficulty and required qualification.

At the beginning of each procedure, the involved unit type is indicated by one of the symbols introduced in this section.

i Please ask your local Fujitsu service center for more detailed information.

2.1.1 Customer Replaceable Units (CRU)

Customer Replaceable Units (CRU)

Non hot-plug peripherals that are handled as Customer Replaceable Units

– Keyboard
– Mouse

2.1.2 Upgrade and Repair Units (URU)

🔧 **Upgrade and Repair Units (URU)**

Upgrade and Repair Units are non hot-plug components that can be ordered separately to be installed as options (*Upgrade Units*).

Upgrade and repair procedures involve shutting down and opening the server.

⚠ **CAUTION!**

The device may be seriously damaged or cause damage if it is opened without authorization or if repairs are attempted by unauthorized and untrained personnel.

Components that are handled as Upgrade Units

– Processors (upgrade kits)
– ODDs
– Backup drives
– Expansion cards
– Memory modules
– Non hot-plug HDDs

Components that are handled solely as Repair Units

– CMOS battery
– Non hot-plug fans

2.1.3 Field Replaceable Units (FRU)

Field Replaceable Units (FRU)

Removing and installing *Field Replaceable Units* involves complex maintenance procedures on integral server components. Procedures will require shutting down, opening and disassembling the server.

CAUTION!

Maintenance procedures involving *Field Replaceable Units* must be performed exclusively by Fujitsu service personnel or technicians trained by Fujitsu. Please note that unauthorized interference with the system will void the warranty and exempt the manufacturer from all liability.

Components that are handled as Field Replaceable Units

– Processors (replacements)
– Front panel (the On/Off button and the HDD activity LED)
– System board
– Standard PSU
– Trusted Platform Module (TPM)

i Please ask your local Fujitsu service center for more detailed information.

2.2   Average task duration

Average task duration: 10 minutes

The average task duration including preliminary and concluding steps is indicated at the beginning of each procedure next to the procedure class.

Refer to table 1 on page 26 for an overview of steps taken into account for calculating the average task duration:

Step	included	Explanation
Server shutdown	no	Shutdown time depends on hardware and software configuration and may vary significantly.
Disassembly	**yes**	making the server available
Transport	no	Transporting the server to the service table (where required) depends on local customer conditions.
Maintenance procedures	**yes**	maintenance procedures including preliminary and concluding software tasks
Transport	no	Returning the server to its installation site (where required) depends on local customer conditions.
Assembly	**yes**	reassembling the server
Starting up	no	Booting time depends on hardware and software configuration and may vary significantly.

Table 1: Calculation of the average task duration

2.3   Tools you need at hand

When preparing the maintenance task, ensure that all required tools are available according to the overview below. You will find a list of required tools at the beginning of each procedure.

Screw driver / Bit insert	Screw	Usage	Type
Phillips PH2 / (+) No. 2 hexagonal cross SW5 / PZ2		Board, Front USB	M3 x 4.5 mm (silver) C26192-Y10-C67
Phillips PH2 / (+) No. 2 hexagonal cross SW5 / PZ2		HDD3, HDD4	UNC 6-32 x 4.76 mm (black) C26192-Y10-C75
TPM bit insert Dedicated TPM screw driver / TPM module fixing tool (for the Japanese market)		TPM screw One way head (black)	REM 3 x 15 mm (black) C26192-Y10-C176
Phillips PH1		2.5 HDD (on request only)	M3x 3.5 / 0.25 Nm (silver) C26192-Y10-C102
Torx Plus Size 6 Philips (+) No.00 silver For EMEA: Torx For Japan: Philips		slimline ODD in additional 5.25 inch bracket	M 2.0 x 2.5 / 0.2 Nm C26192-Y10-C163
Front Fan Rivets Pincer / Side cutter		System fan	C26361-K690-C3

Table 2: List of required tools and used screws

2.4   Documents you need at hand

Maintenance procedures may include references to additional documentation. When preparing the maintenance task, ensure that all required manuals are available according to the overview below.

| i | – Ensure to store all printed manuals enclosed with your server in a save place for future reference. |

– Unless stated otherwise, all manuals are available online at *http://manuals.ts.fujitsu.com* under *Industry standard servers* or from the ServerView Suite DVD 2 supplied with your PRIMERGY server.

For the Japanese market please use the following address: *http://primeserver.fujitsu.com/primergy/manual/*.

Document	Description
"Quick Start Hardware"	Quick installation poster
"PRIMERGY ServerView Suite - Overview & Installation" DVD booklet	DVD booklet on initial software configuration included as a printed copy with the ServerView Suite
"Safety notes and regulations" manual " 安全上のご注意 " for the Japanese market	Important safety information, available from the ServerView Suite DVD 2, online at *http://manuals.ts.fujitsu.com* and as a printed copy
"PRIMERGY MX130 S2 Server Operating Manual"	available from the ServerView Suite DVD 2 or online at *http://manuals.ts.fujitsu.com*
"Short Description - Mainboard D3090 / D3091"	Information on system board features, layout, connectors and indicators, available from the ServerView Suite DVD 2 or online at *http://manuals.ts.fujitsu.com*
"Description - BIOS Manual D3090 / D3091"	Information on configurable BIOS options and parameters, available from the ServerView Suite DVD 2 or online at *http://manuals.ts.fujitsu.com*
Software documentation	– "ServerView Operations Manager - Server Management" user guide

Table 3: Documentation you need at hand

Document	Description
Glossary	available from the ServerView Suite DVD 2 or online at *http://manuals.ts.fujitsu.com*
"Warranty" manual " 保証書 " for the Japanese market	Important information on warranty regulations, recycling and service, available from the ServerView Suite DVD 2, online at *http://manuals.ts.fujitsu.com* or as a printed copy
"Returning used devices" manual	Recycling and contact information, available from the ServerView Suite DVD 2, online at *http://manuals.ts.fujitsu.com* or as a printed copy
"Service Desk" leaflet " サポート＆サービス " for the Japanese market	
Third party documentation	– Operating system documentation, online help – Peripherals documentation

Table 3: Documentation you need at hand

3 Important information

⚠️ **CAUTION!**

Before installing and starting up a device, please observe the safety instructions listed in the following section. This will help you to avoid making serious errors that could impair your health, damage the device and endanger the data base.

ℹ️ Keep all manual and the other documentation (such as the technical manual, documentation DVD) close to the device. All documentation must be included if the equipment is passed on to a third party.

3.1 Safety instructions

ℹ️ The following safety instructions are also provided in the manual "Safety Notes and Regulations" or " 安全上のご注意 ".

This device meets the relevant safety regulations for IT equipment. If you have any questions about whether you can install the server in the intended environment, please contact your sales outlet or our customer service team.

● The actions described in this manual shall be performed by technical specialists. A technical specialist is a person who is trained to install the server including hardware and software.

● Repairs to the device that do not relate to CSS failures shall be performed by service personnel. Please note that unauthorized interference with the system will void the warranty and exempt the manufacturer from all liability.

● Any failure to observe the guidelines in this manual, and any improper repairs could expose the user to risks (electric shock, energy hazards, fire hazards) or damage the equipment.

● Before installing/removing internal options to/from the server, turn off the server, all peripheral devices, and any other connected devices. Also unplug all power cords from the power outlet. Failure to do so can cause electric shock or damage.

Before starting up

● During installation and before operating the device, observe the instructions on environmental conditions for your device.

- If the device is brought in from a cold environment, condensation may form both inside and on the outside of the device.

  Wait until the device has acclimatized to room temperature and is absolutely dry before starting it up. Material damage may be caused to the device if this requirement is not observed.

- Transport the device only in the original packaging or in packaging that protects it from knocks and jolts.
  For the Japanese market, transporting the device in its original packaging does not apply.

Installation and operation

- This unit should not be operated in ambient temperatures above 35 °C.

- If the unit is integrated into an installation that draws power from an industrial power supply network with an IEC309 connector, the power supply's fuse protection must comply with the requirements for non-industrial power supply networks for type A connectors.

- The unit automatically adjusts itself to a mains voltage in a range of 100 V - 240 V. Ensure that the local mains voltage lies within these limits.

- This device must only be connected to properly grounded power outlets or connected to the grounded rack internal power distribution system with tested and approved power cords.

- Ensure that the device is connected to a properly grounded power outlet close to the device.

- Ensure that the power sockets on the device and the properly grounded power outlets are easily accessible.

- The On/Off button or the main power switch (if present) does not isolate the device from the mains power supply. In case of repair or servicing disconnect the device completely from the mains power supply, unplug all power plugs from the properly grounded power outlets.

- Always connect the server and the attached peripherals to the same power circuit. Otherwise you run the risk of losing data if, for example, the server is still running but a peripheral device (e.g. memory subsystem) fails during a power outage.

- Data cables must be adequately shielded.

- Ethernet cabling has to comply with EN 50173 and EN 50174-1/2 standards or ISO/IEC 11801 standard respectively. The minimum requirement is a Category 5 shielded cable for 10/100 Ethernet, or a Category 5e cable for Gigabit Ethernet.

- Route the cables in such a way that they do not create a potential hazard (make sure no-one can trip over them) and that they cannot be damaged. When connecting the server, refer to the relevant instructions in this manual.

- Never connect or disconnect data transmission lines during a storm (risk of lightning hazard).

- Make sure that no objects (e.g. jewelry, paperclips etc.) or liquids can get inside the server (risk of electric shock, short circuit).

- In emergencies (e.g. damaged casing, controls or cables, penetration of liquids or foreign bodies), contact the system administrator or your customer service team. Only disconnect the system from the mains power supply if there is no risk of harming yourself.

- Proper operation of the system (in accordance with IEC 60950-1 resp. EN 60950-1) is only ensured if the casing is completely assembled and the rear covers for the installation slots have been fitted (electric shock, cooling, fire protection, interference suppression).

- Only install system expansions that satisfy the requirements and rules governing safety and electromagnetic compatibility and those relating to telecommunication terminals. If you install other expansions, they may damage the system or violate the safety regulations. Information on which system expansions are approved for installation can be obtained from our customer service center or your sales outlet.

- The components marked with a warning notice (e.g. lightning symbol) may only be opened, removed or exchanged by authorized, qualified personnel. Exception: CSS components can be replaced.

- The warranty is void if the server is damaged during installation or replacement of system expansions.

- Only set screen resolutions and refresh rates that are specified in the operating manual for the monitor. Otherwise, you may damage your monitor. If you are in any doubt, contact your sales outlet or customer service center.

- Before installing/removing internal options to/from the server, turn off the server, all peripheral devices, and any other connected devices. Also unplug all power cords from the outlet. Failure to do so can cause electric shock.

Important information

- Do not damage or modify internal cables or devices. Doing so may cause a device failure, fire, or electric shock and will void the warranty and exempt the manufacturer from all liability.

- Devices inside the server remain hot after shutdown. Wait for a while after shutdown before installing or removing internal options.

- The circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. To ensure reliable protection, if you are wearing an earthing band on your wrist when working with this type of module, connect it to an unpainted, non-conducting metal part of the system.

- Do not touch the circuitry on boards or soldered parts. Hold the metallic areas or the edges of the circuit boards.

- Install the screw removed during installation/detaching internal options in former device/position. To use a screw of the different kind can cause a breakdown of equipment.

- The installation indicated on this document is sometimes changed to the kind of possible options without notice.

Batteries

● Incorrect replacement of batteries may lead to a risk of explosion. The batteries may only be replaced with identical batteries or with a type recommended by the manufacturer.

● Do not throw batteries into the trash can.

● Batteries must be disposed of in accordance with local regulations concerning special waste.

● Make sure that you insert the battery the right way round.

● The battery used in this device may present a fire or chemical burn hazard if mistreated. Do not disassemble, heat about 100 °C (212F), or incinerate the battery.

● All batteries containing pollutants are marked with a symbol (a crossed-out garbage can). In addition, the marking is provided with the chemical symbol of the heavy metal decisive for the classification as a pollutant:

Cd Cadmium
Hg Mercury
Pb Lead

Working with ODDs and media

When working with ODDs, these instructions must be followed.

⚠ **CAUTION!**

● Only use CDs/DVDs/BDs that are in perfect condition, in order to prevent data loss, equipment damage and injury.

● Check each CD/DVD/BD for damage, cracks, breakages etc. before inserting it in the drive.

Note that any additional labels applied may change the mechanical properties of a CD/DVD/BD and cause imbalance and vibrations.

Damaged and imbalanced CDs/DVDs/BDs can break at high drive speeds (data loss).

Under certain circumstances, sharp CD/DVD/BD fragments can pierce the cover of the ODD (equipment damage) and can fly out of the device (danger of injury, particularly to uncovered body parts such as the face or neck).

- High humidity and airborne dust levels are to be avoided. Electric shocks and/or server failures may be caused by liquids such as water, or metallic items, such as paper clips, entering a drive.

- Shocks and vibrations are also to be avoided.

- Do not insert any objects other than the specified CDs/DVDs/BDs.

- Do not pull on, press hard, or otherwise handle the CD/DVD/BD tray roughly.

- Do not disassemble the ODD.

- Before use, clean the optical disk tray using a soft, dry cloth.

- As a precaution, remove disks from the ODD when the drive is not to be used for a long time. Keep the optical disk tray closed to prevent foreign matter, such as dust, from entering the ODD.

- Hold CDs/DVDs/BDs by their edges to avoid contact with the disk surface.

- Do not contaminate the CD/DVD/BD surface with fingerprints, oil, dust, etc. If dirty, clean with a soft, dry cloth, wiping from the center to the edge. Do not use benzene, thinners, water, record sprays, antistatic agents, or silicone-impregnated cloth.

- Be careful not to damage the CD/DVD/BD surface.

- Keep the CDs/DVDs/BDs away from heat sources.

- Do not bend or place heavy objects on CDs/DVDs/BDs.

- Do not write with ballpoint pen or pencil on the label (printed) side.

- When a CD/DVD/BD is moved from a cold place to a warm place, moisture condensation on the CD/DVD/BD surface can cause data read errors. In this case, wipe the CD/DVD/BD with a soft, dry cloth then let it air dry. Do not dry the CD/DVD/BD using devices such as a hair dryer.

- To avoid dust, damage, and deformation, keep the CD/DVD/BD in its case whenever it is not in use.

- Do not store CDs/DVDs/BDs at high temperatures. Areas exposed to prolonged direct sunlight or near heating appliances are to be avoided.

> **i** You can prevent damage from the ODD and the CDs/DVDs/BDs, as well as premature wear of the disks, by observing the following suggestions:
>
> – Only insert disks in the drive when needed and remove them after use.
> – Store the disks in suitable sleeves.
> – Protect the disks from exposure to heat and direct sunlight.

Laser information

The ODD complies with IEC 60825-1 laser class 1.

⚠ **CAUTION!**

The ODD contains a light-emitting diode (LED), which under certain circumstances produces a laser beam stronger than laser class 1. Looking directly at this beam is dangerous.

Never remove parts of the ODD casing!

Modules with Electrostatic-Sensitive Devices

Modules with electrostatic-sensitive devices are identified by the following sticker:
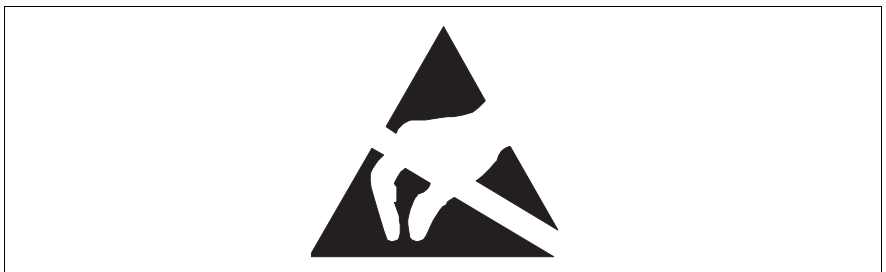
Figure 1: ESD label

When you handle components fitted with ESDs, you must always observe the following points:

● Switch off the system and remove the power plugs from the power outlets before installing or removing components with ESDs.

● The circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. To ensure reliable protection, you must wear an earthing band on your wrist when working with this type of module and connect it to an unpainted, non-conducting metal part of the system.

Important information

- Any devices or tools that are used must be free of electrostatic charge.

- Wear a suitable grounding cable that connects you to the external chassis of the system unit.

- Always hold components with ESDs at the edges or at the points marked green (touch points).

- Do not touch any connectors or conduction paths on an ESD.

- Place all the components on a pad which is free of electrostatic charge.

  i For a detailed description of how to handle ESD components, see the relevant European or international standards (EN 61340-5-1, ANSI/ESD S20.20).

Transporting the server

- Only transport the server in its original packaging or in packaging that protects it from impacts and jolts.
  For the Japanese market, transporting the device in its original packaging does not apply.

- Do not unpack the server until it is at its installation location.

3.2 ENERGY STAR

i Energy Star is applicable only for 230 V mains voltage.

ENERGY STAR does not apply to the Japanese market.

In typical configurations the PRIMERGY MX130 S2 satisfies the stringent requirements of the Ecolabel Energy Star for Computers Version 5.0. These requirements ensure energy savings when computers are being used and performing a range of tasks, as well as when they are turned off or into a low power mode. For example, the power consumption of the PRIMERGY MX130 S2 in the operation mode "idle" is less than 65 W.

Products that have been certified compliant with ENERGY STAR and identified as such are in full compliance with the specification at shipping. Note that energy consumption can be affected by software that is installed or any changes that are made to the BIOS or energy options subsequently. In such cases, the properties guaranteed by ENERGY STAR can no longer be assured.

Devices that are certified in accordance with ENERGY STAR environmental standards help to save money and reduce greenhouse gas emissions.

Detailed information concerning the requirements for the ENERGY STAR eco-label, as well as products that satisfy these requirements, can be found on the Internet at *http://www.energystar.gov/* .

After you have installed your OS you can configure the energy saving settings by yourself (amongst others switch off the monitor $\leq$ 15 minutes). How you have to configure these energy saving settings is described in the documentation supplied with the OS.

The "ServerView Operations Manager" user guide contains instructions for reading out measurement values, including those relating to current energy consumption and air temperatures. Either the Performance Monitor or the Task Manager can be used to read out CPU utilization levels.

Important information

The system has a hibernate mode (S4 mode) from which it can be woken up via WOL (Wake-up On LAN). In order to use this feature, however, the S4 mode must be activated/enabled in the corresponding operating system installed.

The following description is an example and can only serve as a guide for other operating systems.

To bring your system into S4 mode (= hibernate mode), proceed as follows:

Operating system Microsoft Windows 2008 Enterprise Edition

Activation

► Open the command line tool using C:\Windows\System32\cmd.exe and enter the following command to activate S4 mode:

   powercfg -h ON

Configuration

To set the driver for the internal LAN controller:

► Open the *Device Manager* via *Start - Control Panel - System - Device Manager*.

► Select *Network Adapters*.

► Select the internal LAN controller: Broadcom Netlink™ Gigabit Ethernet.

► Select *Properties* in the overview, and then select *Power Management*.

► In the Wake on LAN field, enable the following option:

   – Allow this device to wake the server.

► Press *OK*.

Execution

To execute the power down command in a DOS shell:

Using the **shutdown -h** command, your system saves all user data (e.g: open windows and running programs), shuts down the system, and transfers it to S4 mode.

Exiting the hibernate/idle state (S4 mode)

You switch on the system again either manually using the On/Off button or using the WOL function (WOL= Wake-up On LAN).

To do this, a Magic Packet with the MAC address of the system to be woken up is sent to the internal LAN controller.

You will find the valid MAC address for your device in the BIOS:

▶ During boot press ⌷F2⌷ to enter BIOS.

▶ Navigate to *Main - System Information* and press ⌷Enter⌷.

The MAC address is shown under *Network Controller Details*.

> **i** Alternatively, you can find out the MAC address valid for your device using the command line tool IPCONFIG.
>
> ▶ Open the command line tool using C:\Windows\System32\cmd.exe and enter the following command:
>
> **ipconfig /all**

LINUX operating systems

Activation

▶ To activate S4 mode, enter the following command:

resume=/dev/sdxx

Using this command, the memory area in which the data is saved is assigned at the same time.

Execution

Using the following command, the system is switched off and brought into S4 mode:

echo -n "disk" > /sys/power/state

Exiting the hibernate/idle state (S4 mode)

You switch on the system again either manually using the On/Off button or using the WOL function (WOL= Wake-up On LAN).

To do this, a Magic Packet with the MAC address of the system to be woken up is sent to the internal LAN controller.

3.3   CE conformity

The system complies with the requirements of the EC directives 2004/108/EC regarding "Electromagnetic Compatibility" and 2006/95/EC "Low Voltage Directive". This is indicated by the CE marking (CE = Communauté Européenne).

3.4 FCC Class A Compliance Statement

If there is an FCC statement on the device, it applies to the products covered in this manual, unless otherwise specified herein. The statement for other products will appear in the accompanying documentation.

NOTE:

This equipment has been tested and found to comply with the limits for a "Class A" digital device, pursuant to Part 15 of the FCC rules and meets all requirements of the Canadian Interference-Causing Equipment Standard ICES-003 for digital apparatus. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in strict accordance with the instructions, may cause harmful interference to radio communications. However, there is no warranty that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

● Reorient or relocate the receiving antenna.

● Increase the separation between equipment and the receiver.

● Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

● Consult the dealer or an experienced radio/TV technician for help.

Fujitsu is not responsible for any radio or television interference caused by unauthorized modifications of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by Fujitsu. The correction of interferences caused by such unauthorized modification, substitution or attachment will be the responsibility of the user.

The use of shielded I/O cables is required when connecting this equipment to any and all optional peripheral or host devices. Failure to do so may violate FCC and ICES rules.

WARNING:

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

3.5 Environmental protection

Environmentally-friendly product design and development

This product has been designed in accordance with the Fujitsu standard for "environmentally friendly product design and development". This means that key factors such as durability, selection and labeling of materials, emissions, packaging, ease of dismantling and recycling have been taken into account.

This saves resources and thus reduces the harm done to the environment. Further information can be found at:

– *http://ts.fujitsu.com/products/standard_servers/index.html* (for the EMEA market)
– *http://primeserver.fujitsu.com/primergy/concept/* (for the Japanese market)

Energy-saving information

Devices that do not need to be constantly switched on should be switched off until they are needed as well as during long breaks and after completion of work.

Packaging information

This packaging information doesn't apply to the Japanese market.

Do not throw away the packaging. You may need it later for transporting the system. If possible, the equipment should only be transported in its original packaging.

Information on handling consumables

Please dispose of printer consumables and batteries in accordance with the applicable national regulations.

In accordance with EU directives, batteries must not be disposed of with unsorted domestic waste. They can be returned free of charge to the manufacturer, dealer or an authorized agent for recycling or disposal.

All batteries containing pollutants are marked with a symbol (a crossed-out garbage can). They are also marked with the chemical symbol for the heavy metal that causes them to be categorized as containing pollutants:

Cd Cadmium
Hg Mercury
Pb Lead

Labels on plastic casing parts

Please avoid sticking your own labels on plastic parts wherever possible, since this makes it difficult to recycle them.

Returns, recycling and disposal

Please handle returns, recycling and disposal in accordance with local regulations.

The device must not be disposed of with domestic waste. This device is labeled in compliance with European directive 2002/96/EC on waste electrical and electronic equipment (WEEE).

This directive sets the framework for returning and recycling used equipment and is valid across the EU. When returning your used device, please use the return and collection systems available to you. Further information can be found at *http://ts.fujitsu.com/recycling*.

Details regarding the return and recycling of devices and consumables within Europe can also be found in the "Returning used devices" manual, via your local Fujitsu branch or from our recycling center in Paderborn:

Fujitsu Technology Solutions
Recycling Center
D-33106 Paderborn

Tel.   +49 5251 525 1410
Fax   +49 5251 525 32 1410

4 Basic hardware procedures

4.1 Using diagnostics information

The "PRIMERGY MX130 S2 Server Operating manual" gives an introduction to server features and provides an overview of available hardware options.

Use the Fujitsu ServerView Suite management software to plan the upgrade or replacement of hardware components. ServerView Suite documentation is available online at *http://manuals.ts.fujitsu.com* or from the ServerView Suite DVD 2 supplied with your PRIMERGY server. Please refer to the following ServerView Suite topics:

– Operation
– Maintenance

4.2 Opening the server

⚠️ **CAUTION!**

● Before removing or installing covers, turn off the server and all peripheral devices. Also unplug all power cables from the outlet. Failure to do so can cause electric shock.

● In order to comply with applicable EMC regulations (regulations on electromagnetic compatibility) and satisfy cooling requirements, the PRIMERGY MX130 S2 server must not run while the server cover is removed.

● For further safety information, please refer to chapter "Important information" on page 31.

4.2.1 Shutting down the server

⚠️ **CAUTION!**

For further safety information, please refer to chapter "Important information" on page 31.

ℹ️ This step is only required when upgrading or replacing non-hot plug components.

► Inform the system administrator that the server will be shut down and put offline.

► Terminate all applications.

► Verify if your backup software solution requires preparative configuration before starting the procedure as described in section "Verifying and configuring the backup software solution" on page 61.

► Remove all backup and optical disk media from backup and optical disk drives as described in section "Removing backup and optical disk media" on page 60.

Figure 2: Power button on the front panel

► Shut down the server.

> **i** If the system is running an ACPI-compliant operating system, pressing the On / Off button will perform a graceful shutdown.

Disconnecting power cords

Figure 3: Removing the power cord from the PSU

► Disconnect the power cord from the PSU module.

Only for Japan: Disconnecting cable tie
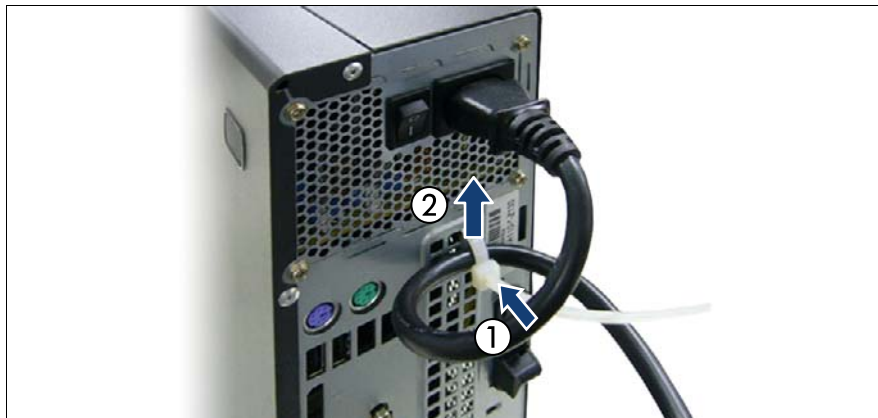
Figure 4: Removing the cable tie

► Pull out on the locking lever on the PSU cable tie (1) and loosen the loope (2).

► Disconnect the power cord from the PSU module and remove it from the cable tie.

4.2.2   Removing the server cover

Figure 5: Unlocking the locking bar

► Slide the locking bar to the left until it rests in place.

Figure 6: Removing the server cover

► Push the server cover to the front.

► Remove the server cover.

4.3 Opening the front cage

Figure 7: Opening the front cage

► Carefully fold open the front cage.

| i | Pay attention to the SATA data cable, especially to the the slimline ODD SATA data cable when you fold open the front cage. If it is located in the additional 5.25-inch bracket, you have to disconnect the SATA data cable from the drive before fold open the front cage. |

4.4   Closing the front cage
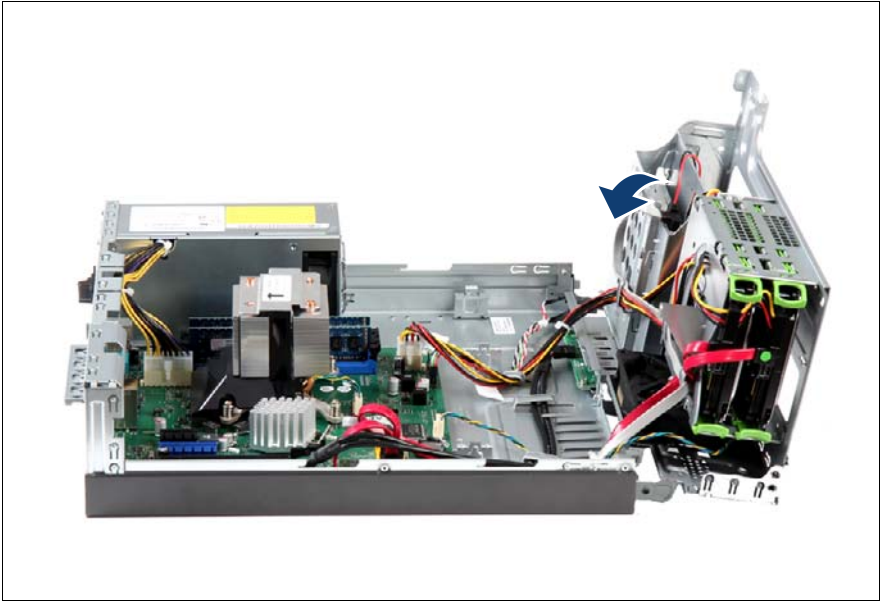
Figure 8: Closing the front cage

► Carefully close the front cage.

⚠ **CAUTION!**

Ensure that none of the cables are strained or trapped!

► If you loosened any cables tighten them again.

4.5   Closing the server

⚠ **CAUTION!**

● Before attaching the covers, make sure no unnecessary parts or tools are left inside the server.

● In order to comply with applicable EMC regulations (regulations on electromagnetic compatibility) and satisfy cooling requirements, the PRIMERGY MX130 S2 server must not run while the server cover is removed.

● For further safety information, please refer to chapter "Important information" on page 31.

4.5.1   Mounting the server cover

Figure 9: Mounting the server cover

▶   Fit the server cover on the chassis.

Figure 10: Closing the server cover

► Slide the server cover shut by engaging the locking mechanism.

4.5.2   Connecting the server to the mains

The PRIMERGY MX130 S2 Server is equipped with a standard PSU.

⚠ **CAUTION!**

The power supply automatically adjusts to any mains voltage in the range of 100 V - 240 V. You may only operate the server if its rated voltage range corresponds to the local mains voltage.

► Connect the insulated connector of the power cable to the PSU of the server.

► Connect the mains plug to a grounded mains outlet in the in-house power supply network.

Connecting power cord

Figure 11: Connecting power cord

► Connect the power cord to the power supply.

Only for Japan: Connecting the cable tie
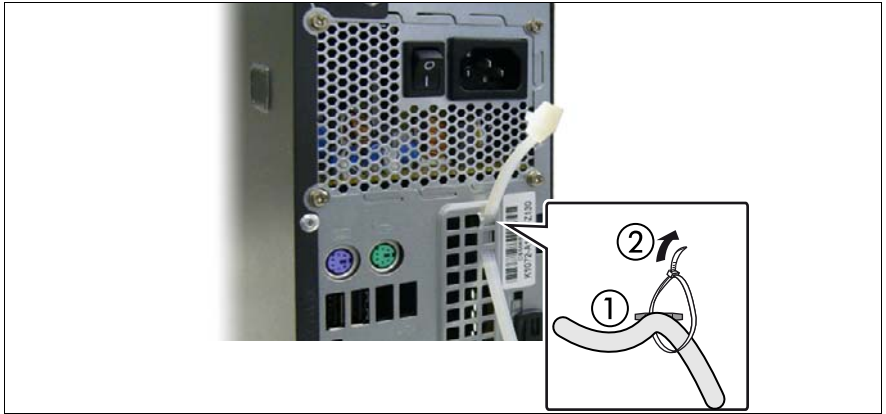
Figure 12: Connecting the cable tie

▶ Thread the cable tie through the eye (1).

▶ Pull the cable tie tight to secure the power cord (2).

The insulated connector cannot now be disconnected from the server accidentally.

4.6 Switching on the server

⚠️ **CAUTION!**

● Before switching on the server, make sure the server cover is closed. In order to comply with applicable EMC regulations (regulations on electromagnetic compatibility) and satisfy cooling requirements, the PRIMERGY MX130 S2 server must not run while the server cover is removed.

● Follow the safety instructions in chapter "Important information" on page 31.

► Connect all peripheral cables to the rear connector panel of the server.

► Connect the power cord as described in section "Connecting the server to the mains" on page 55.

► Connect the power cord to the power outlet.

Figure 13: Power button on the front panel

► Press the On / Off button to start up the server (1).

► Ensure that the power-on indicator in the On / Off button is lit green.

ℹ️ For more information see "Front panel and front USB" on page 223.

5 Basic software procedures

5.1 Starting the maintenance task

5.1.1 Disabling BitLocker functionality

BitLocker Drive Encryption provides protection for operating system and data drives by encrypting the contents and requiring users to authenticate their credentials to access the information. On the operating system drive, BitLocker uses the compatible Trusted Platform Module (TPM) to detect if the computer's startup process has been modified from its original state.

Disabling BitLocker Drive Encryption is a temporary method for removing BitLocker protection without decrypting the drive Windows is installed on. Disable BitLocker before modifying the server's hardware configuration or startup files. Enable BitLocker again after the maintenance procedure is complete.

> ⚠ **CAUTION!**
>
> – With BitLocker features enabled, modifying the system configuration (hardware or firmware settings) may render the system inaccessible. The system may enter Recovery Mode and require a 48-digits recovery password to return to normal operation.
>
>   Ensure to disable BitLocker drive encryption before maintaining the server.
>
> – When disabled, BitLocker uses a plain text key instead of the Trusted Platform Module (TPM) to read encrypted files. Keep in mind that information on this drive is not secure until BitLocker has been re-enabled.

► Ask the system administrator to disable BitLocker-protection on the operating system drive, using the BitLocker setup wizard available either from the Control Panel or Windows Explorer:

  ► Open Bitlocker Drive Encryption by clicking the *Start* button, clicking *Control Panel*, clicking *Security*, and then clicking *Bitlocker Drive Encryption*.

> **i** Administrator permission required: If you are prompted for an administrator password or confirmation, type the password or provide confirmation.

► To temporarily disable BitLocker, click *Turn Off BitLocker*, and then click *Disable BitLocker Drive Encryption*.

> **i** In order to determine which features are accessible through the BitLocker setup wizard, modify the BitLocker Group Policy settings.
>
> For further information on how to disable BitLocker drive encryption, please refer to the Microsoft Knowledge Base.
>
> Fujitsu service partners will find additional information (also available in Japanese) on the Fujitsu Extranet web pages.

5.1.2   Removing backup and optical disk media

► Ask the system administrator to eject all remaining backup or optical media from the backup or optical disk drive before removing it from the server.

► If the backup media cannot be ejected by conventional means, and it is mandatory that the cartridge be removed prior to returning the drive for repair or disposing it, a manual tape extraction needs to be performed.

For further information on "forcible" tape ejection, please refer to the "Tape Facts" guide available to Fujitsu service partners from the following https address:

https://partners.ts.fujitsu.com/com/service/ps/Servers/PRIMERGY/Pages/ TapeFacts.aspx

> **i** Fujitsu does not assume responsibility for any damage to the tape drive, the data cartridge / tape or for the loss of any data resulting from manual tape extraction procedures.

5.1.3　Verifying and configuring the backup software solution

> **i**　This task only applies to the Japanese market.

Depending on the backup software solution, it may be necessary to disable or delete the backup drive from the backup software drive list before starting the maintenance task.

This is the case for the following backup software solution:

– BackupExec

> **i**　Procedures may differ depending on the backup software. For details, refer to the dedicated documentation provided separately.
>
> Further information on suitable backup software solutions and related documentation is available to Fujitsu service partners from the Fujitsu Extranet pages.

5.2 Completing the maintenance task

5.2.1 Updating the system board BIOS

After replacing the system board, it is essential to upgrade the BIOS to the latest version.

The latest BIOS versions are available from the Fujitsu support internet pages at:

http://ts.fujitsu.com/support/ (EMEA market)
http://primeserver.fujitsu.com/primergy/downloads/ (Japanese market)

> **i** Fujitsu does not assume responsibility for any damage done to the server or for the loss of any data resulting from BIOS updates.

BIOS recovery procedure

> **i** For the Japanese market, follow the instructions provided separately.

► Prepare a USB stick with the following files:

– Update tool

– *Startup.nsh* (which will execute the update tool)

– BIOS image file for update (16 MB with header information)

► Ensure that the server has been shut down and disconnected from the mains as described in sections "Shutting down the server" on page 48.

► Open the side cover as described in section "Opening the server" on page 48.

► Enter BIOS recovery mode using the onboard jumpers.

> **i** For detailed information on jumper settings, refer to section "Onboard settings" on page 250.

► Close the side cover as described in section "Closing the server" on page 54.

► Connect the USB stick to the USB port.

► Connect the server to the mains as described in section "Connecting the server to the mains" on page 55.

► Press the On / Off button to start up the server.

The system will detect the USB stick and the BIOS recovery process will be performed.

⚠ **CAUTION!**

Do not interrupt the BIOS upgrade process after it has started. If the process is interrupted, the system BIOS may be permanently corrupted.

► After completion of the flash process, shut down the server.

► Open the side cover as described in section "Closing the server" on page 54.

► Disable BIOS recovery mode using the onboard jumpers:

ℹ For detailed information on jumper settings, refer to section "Onboard settings" on page 250.

► Close the side cover as described in section "Closing the server" on page 54.

5.2.2 Updating RAID controller firmware

The onboard RAID controller firmware is updated with the system board BIOS. Please proceed as described in section "Updating the system board BIOS" on page 62.

5.2.3 Enabling Option ROM scan

In order to configure an expansion card that has been installed or replaced, the card's Option ROM has to be enabled in the system board BIOS. The card's firmware is called by the system BIOS upon reboot and can be entered and configured.

Option ROM can be enabled permanently (e.g. in case of a boot controller that may require frequent setup) or temporarily for one-time configuration.

When the enabled expansion card is initialized during the POST phase of the boot sequence, a key combination is displayed temporarily to enter the expansion card's firmware.

▶ Press the displayed key combination.

▶ Modify the expansion card firmware options as desired.

▶ Save your changes and exit the firmware.

As default setting for this system, Option ROM is enabled for all onboard controllers and all expansion card slots.

For detailed information on how to access the BIOS and modify settings, refer to the "D3090/D3091 BIOS Manual".

5.2.4 Verifying and configuring the backup software solution

i This task only applies to the Japanese market.

Disabling backup drives

Depending on the backup software solution, it may be necessary to disable or delete the backup drive from the backup software drive list and reconfigure backup jobs after completing the maintenance task.

This is the case for the following backup software solutions:

– Netvault for Windows
– ARCServe
– BackupExec

> **i** Procedures may differ depending on the backup software. For details, refer to the dedicated documentation provided separately.
>
> Further information on suitable backup software solutions and related documentation is available to Fujitsu service partners from the Fujitsu Extranet pages.

Re-enabling backup drives

If a backup drive has been disabled or deleted from the backup software drive list as described in section 5.1.3 on page 61, it has to be re-enabled to complete the maintenance task.

► Re-enable backup drives and revise backup software settings and cronjobs.

> **i** Detailed information on suitable backup software solutions and related documentation is available to Fujitsu service partners from the Fujitsu Extranet pages

5.2.5   Viewing the System Event Log (SEL)

You can view the System Event Log (SEL) using the ServerView Operations Manager:

► In ServerView Operations Manager *Single System View* select *Maintenance* from the *Information / Operation* menu.

► Under *Maintenance* select *System Event Log*.

► Select the message type(s) you want to display:

  – Critical events
  – Major events
  – Minor events
  – Informational events

> **i** For detailed information on how to view and sort the SEL using ServerView Operations Manager, refer to the "ServerView Operations Manager - Server Management" user guide.

5.2.6   Enabling BitLocker functionality

If BitLocker Drive Encryption has been disabled for maintenance purposes (see
section "Disabling BitLocker functionality" on page 59), it has to be re-enabled
to complete the service task.

> **i**   If BitLocker Drive Encryption has been disabled prior to replacing
> components you won't be asked for a recovery key when rebooting the
> server after the maintenance task. However, if BitLocker functionality has
> not been disabled, Windows will enter recovery mode and ask you to
> input recovery key for further booting.
>
> ► In this case, ask the system administrator to enter the recovery key in
>   order to boot the operating system.

► Ask the system administrator to enable BitLocker-protection on the
   operating system drive, using the BitLocker setup wizard available either
   from the Control Panel or Windows Explorer.

   ► Open Bitlocker Drive Encryption by clicking the *Start* button, clicking
      Control Panel, clicking *Security*, and then clicking *Bitlocker Drive
      Encryption*.

   > **i**   Administrator permission required: If you are prompted for an
   > administrator password or confirmation, type the password or
   > provide confirmation.

   ► To enable a temporarily disabled BitLocker, click *Turn On BitLocker*.

   ► Follow the instructions in the BitLocker Setup wizard.

> **i**   For further information on how to enable BitLocker drive encryption,
> please refer to the Microsoft Knowledge Base.
>
> Fujitsu service partners will find additional information (also available in
> Japanese) on the Fujitsu Extranet web pages.

5.2.7 Performing a RAID array rebuild

After replacing a hard disk drive that has been combined into a RAID array, RAID rebuild will be performed completely unattended as a background process.
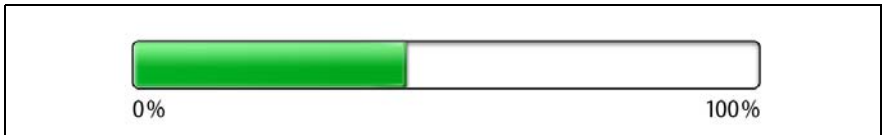
Figure 14: Progress bar (RAID array rebuild)

CAUTION!

The system is now operational, however, data redundancy will not be available until the RAID array rebuild is complete. Depending on the hard disk drive capacity the overall process can take up to several hours, in some cases even days.

i You may notice a slight performance impact during rebuild.

5.2.8 Looking up changed MAC addresses

When replacing the system board, the MAC (Media Access Control) address will change. In order to look up changed MAC adresses, proceed as follows:

► Enter the BIOS.

► In the *Main* menu, select *System Information* and press [Enter].

► Note down the new 12-digit MAC address displayed under *Network Controller Details*.

► Press [Esc] to exit the *System Information* menu.

► Press [Esc] to exit the BIOS.

► Inform the customer about the changed MAC address.

5.2.9   Using the Chassis ID Prom Tool

The Chassis ID EPROM located on the system board contains system information like server name and model, housing type, serial number and manufacturing data.

In order to integrate your system into the ServerView management environment and to enable server installation using the ServerView Installation Manager, system data needs to be complete and correct.

After replacing the system board, system information has to be entered using the *ChassisID_Prom* Tool. The tool and further instructions are available to maintenance personnel from Fujitsu Technology Solutions Extranet:

https://partners.ts.fujitsu.com/com/service/intelservers/tools

> **i** For the Japanese market, follow the instructions provided separately.

6   Power supply

Basic information

The PRIMERGY MX130 S2 server is equipped with a standard PSU.

⚠️ **CAUTION!**

The server supports a mains voltage in the range of 100 V - 240 V You may only operate the server if its rated voltage range corresponds to the local mains voltage.

Safety notes

⚠️ **CAUTION!**

● Do not disassemble the PSU. Doing so may cause electric shock.

● Areas around the PSU may remain extremely hot after shutdown. After shutting down the server, wait for hot components to cool down before removing PSUs.

● The PSU is heavy, so handle it carefully. If you drop it by mistake, injuries may result.

● For further safety information, please refer to chapter "Important information" on page 31.

6.1 Standard PSU

6.1.1 Replacing the standard PSU

Field Replaceable Units (FRU)

Average task duration: 10 minutes

6.1.1.1 Required tools

● Preliminary and concluding steps: tool-less

● Replacing the PSU:

– Phillips PH2 / (+) No. 2 screw driver

6.1.1.2 Preliminary steps

Before replacing the standard PSU, perform the following steps:

| i | You are advised to perform this routine with the server in a horizontal position.

► Disable BitLocker functionality as described in section "Disabling BitLocker functionality" on page 59.

► Follow all procedures described in section "Opening the server" on page 48.

6.1.1.3   Disconnecting internal power cables
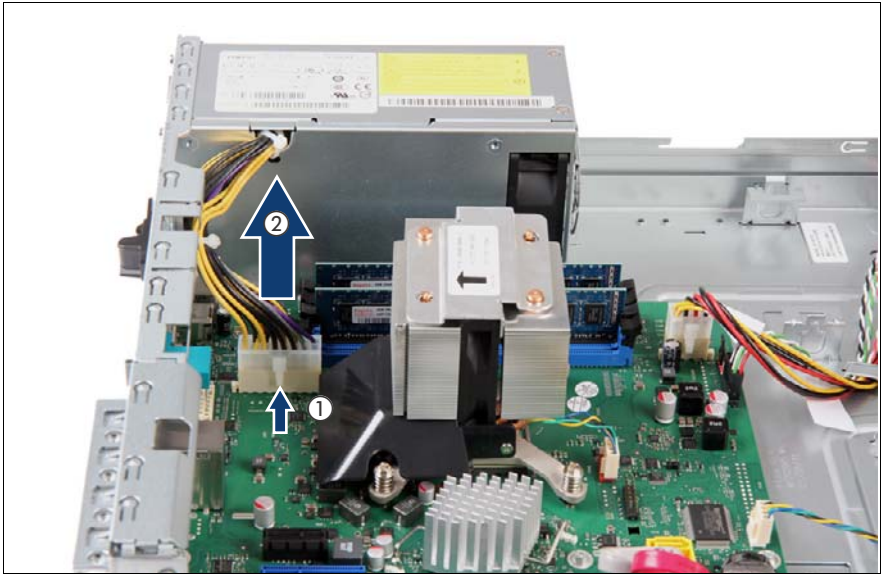
Figure 15: Disconnecting internal power cables

► While pressing the release latch (1) on the connector, disconnect the PSU ATX power connector from system board connector POWER12V (2)

6.1.1.4   Removing the PSU
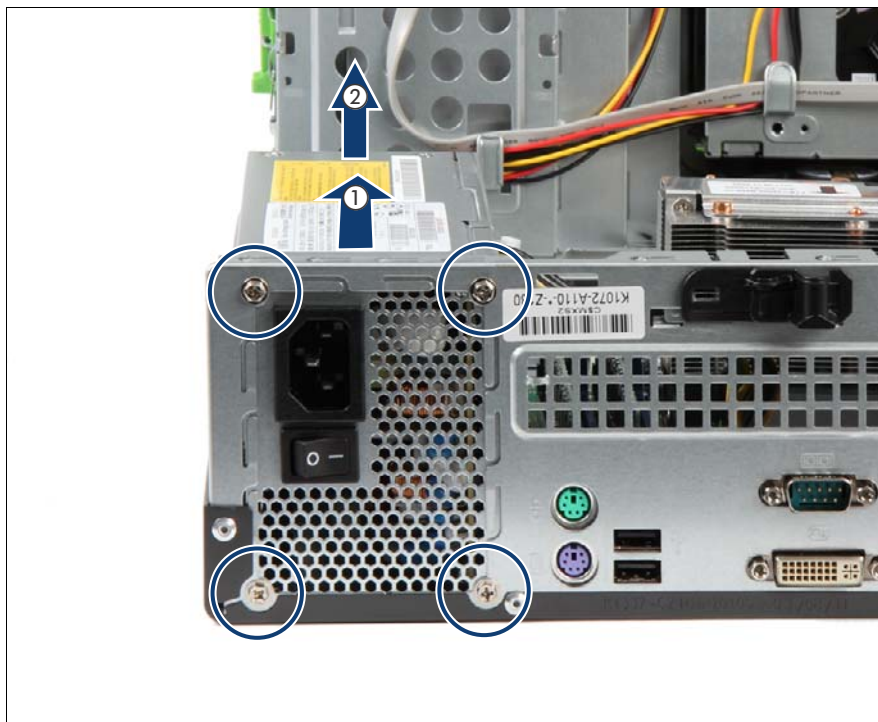
Figure 16: Removing the PSU

► Remove four screws from the PSU (see circles).

► Slide the defective PSU inward by 3 cm (1) to disengage the locking mechanism.

► Lift the defective PSU out of the chassis (2).

6.1.1.5   Installing the PSU
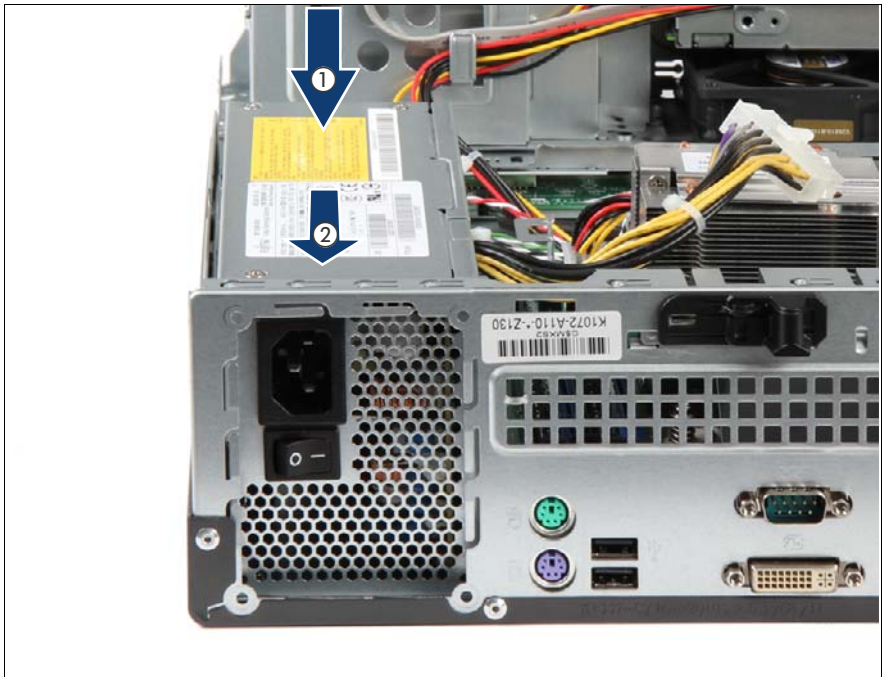
Figure 17: Installing the PSU

Figure 18: Installing the standard PSU

► Insert the PSU into the chassis leaving a gap of about 3 cm to the rear chassis wall (1) in figure 17.

► Ensure that the mounting bracket on the chassis (see circle in figure 18) engages with the notch on the lower surface of the PSU.

► Slide the new PSU towards the rear of the chassis (2) in figure 17.
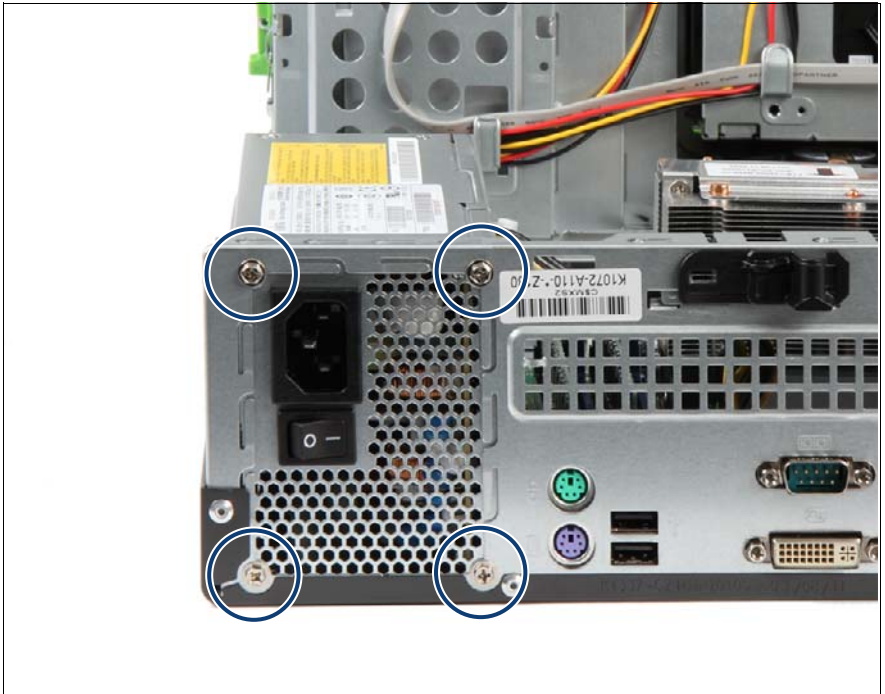
Figure 19: Securing the PSU

► Secure the PSU to the chassis with four screws (M3 x 4.5 mm, see circles).

6.1.1.6   Reconnecting internal power cables
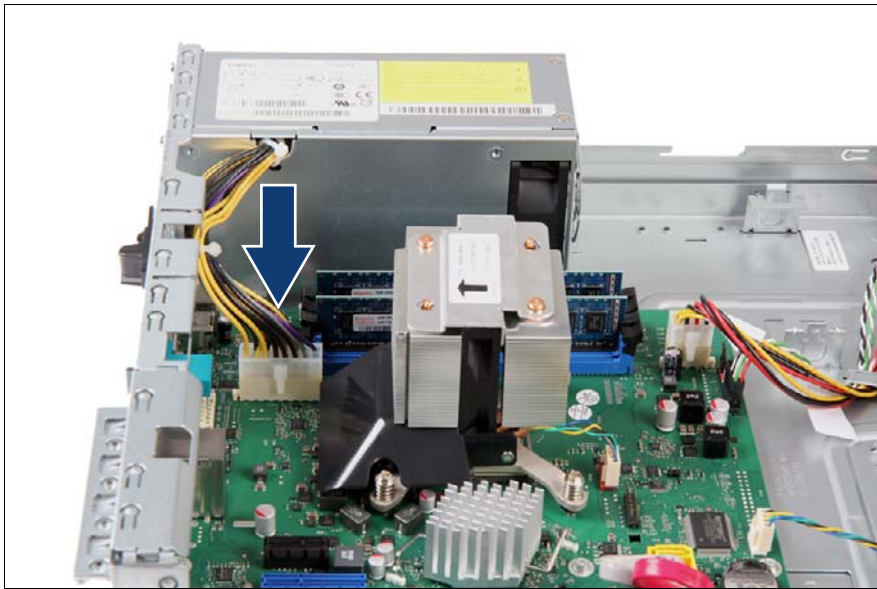
Figure 20: Connecting internal power cables

► Connect the PSU ATX power connector to system board connector POWER12V.

6.1.1.7   Concluding steps

Perform the following procedures to complete the task:

► Follow all procedures described in section "Closing the server" on page 54.

► If BitLocker functionality is used and has been disabled before starting the maintenance task, re-enable BitLocker as described in section "Enabling BitLocker functionality" on page 66.

7   HDDs and accessible drives

Safety notes

⚠ **CAUTION!**

● The HDDs must all be marked clearly so that they can be put back in their original places after an upgrade. If this is not done, existing data can be lost.

● When a HDD is starting up, a resonant noise may be audible for a short while. This does not indicate a failure.

● Depending on the OS, you can configure the write cache settings for the HDDs. If a power failure should occur while the write cache is enabled, cached data may be lost.

● When disposing of, transferring, or returning a hard disk or solid state drive, wipe out the data on the drive for your own security.

● Rough handling of HDDs may damage the stored data. To cope with any unexpected problems, always back up important data. When backing up data to another HDD, you should make backups on a file or partition basis.

● Handle the device on a shock and vibration free surface.

● Do not use the device in extremely hot or cold locations, or locations with extreme temperature changes.

● Never attempt to disassemble a hard disk or solid state drive.

● Before removing a HDD, wait for about 30 seconds until the disk has stopped spinning completely.

● Before installing an accessible drive, acquaint yourself with the drive's user documentation.

● When inserting an accessible drive into the server, ensure not to pinch or strain any connected cables.

● When installing an accessible drive, hold it by its sides. Applying force to the top of the casing may cause failures.

● When disposing of, transferring, or returning a backup drive, ensure that all backup media has been removed from the drive.

- Do not touch the circuitry on boards or soldered parts. Hold circuit boards by their metallic areas or edges.

- Circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. Always discharge static build-up (e.g. by touching a grounded object) before handling electrostatic-sensitive devices (ESDs).

- For further safety information, please refer to chapter "Important information" on page 31.

In this chapter

i 2.5-inch SATA HDDs available on project request in EMEA market only.

● "Installing backup drive in 5.25-inch chassis bay" on page 130

● "Removing backup drive out of 5.25-inch chassis bay" on page 133

● "Installing slimline ODD in slimline chassis bay" on page 136

● "Replacing slimline ODD out of slimline chassis bay" on page 142

7.1   Basic procedure

– HDDs with different capacities are installed from lowest to highest capacity.

– HDDs with different rotation speeds are installed from lowest to highest speed.

– Please refer to section "Mounting order" on page 82 for a complete overview of the mounting sequence.

7.2 Mounting order

Maximum configuration: 4 x 3.5-inch HDD + slimline ODD

Figure 21: Slimline ODD mounting order with 4 x 3.5-inch HDD

Figure 22: Slimline ODD mounting order with 3 x 3.5inch HDD or 2 x 3.5inch HDD and RDX

Figure 23: HH ODD or RDX mounting order with 3 x 3.5-inch HDD

7.3   Installing 3.5-inch HDD in HDD1 / HDD2 chassis bay

Upgrade and Repair Units (URU)

Average task duration: 5 minutes

7.3.1   Required tools

● Preliminary and concluding steps: tool-less

● Installing a 3.5-inch HDD: tool-less

7.3.2   Preliminary steps

Before installing a 3.5-inch HDD, perform the following steps:

► Follow all procedures described in section "Opening the server" on page 48.

► Open the front cage as described in section "Opening the front cage" on page 52.

► Locate the correct drive bay as described in section "Mounting order" on page 82.

7.3.3   Installing a 3.5-inch HDD in HDD 1/HDD 2 chassis bay

► Detach and remove the Easy rails from the desired 3.5-inch HDD installation bay.

Align the three pins on the Easy rails with the screw holes on the new HDD.

Figure 24: Installing the Easy rail on the 3.5-inch HDD

► Attach an Easy rail on each side of the new HDD
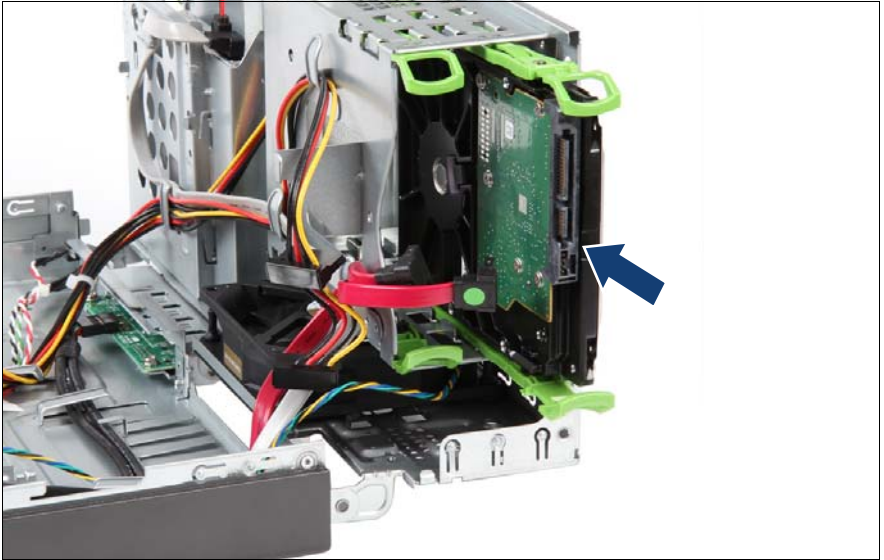
Figure 25: Inserting the 3.5-inch HDD

► Insert the HDD into its installation bay.
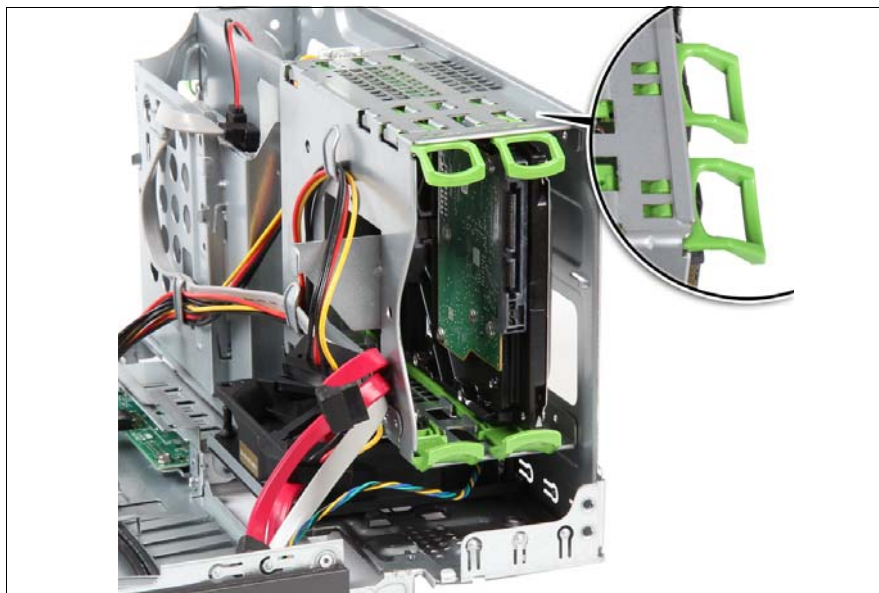
Figure 26: Installing the 3.5-inch HDD

► Slide the HDD into its installation bay until the locking latches engage.
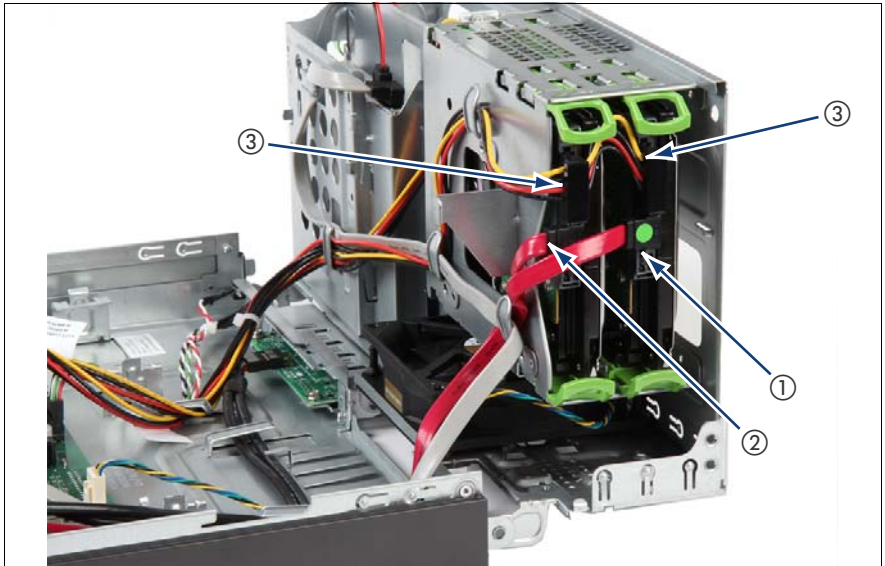
Figure 27: Connecting the cables

► Connect the two SATA connectors to the HDDs (1 and 2).

► Plug the cable with the green point to the upper HDD1.

  For orientation there is a second green point on the other end of this cable.

► Connect the power connectors (3).

7.3.4   Concluding steps

Perform the following procedures to complete the task:

► Close the front cage as described in section "Closing the front cage" on page 53.

► Follow all procedures described in section "Closing the server" on page 54.

► Please observe the notes on RAID rebuild in section "Performing a RAID array rebuild" on page 67.

7.4 Removing 3.5-inch HDD out of HDD1 / HDD2 chassis bay

Upgrade and Repair Units (URU)

Average task duration: 5 minutes

7.4.1 Required tools

● Preliminary and concluding steps: tool-less

● Removing a 3.5-inch HDD: tool-less

7.4.2 Preliminary steps

Before removing a 3.5-inch HDD, perform the following steps:

► Ensure that the HDD to be removed is not combined into a RAID array. If the drive is part of a RAID array, you first need to delete the array using ServerView RAID Manager.

CAUTION!

All data on all HDDs in the array will be lost! Be sure to back up your data before deleting a RAID array.

For further information, please refer to the "ServerView Suite RAID Management" user guide, available online at *http://manuals.ts.fujitsu.com* or from the ServerView Suite DVD 2 supplied with your PRIMERGY server.

► Follow all procedures described in section "Opening the server" on page 48.

► Open the front cage as described in section "Opening the front cage" on page 52.

7.4.3 Removing a 3.5-inch HDD out of HDD 1/HDD 2 chassis bay
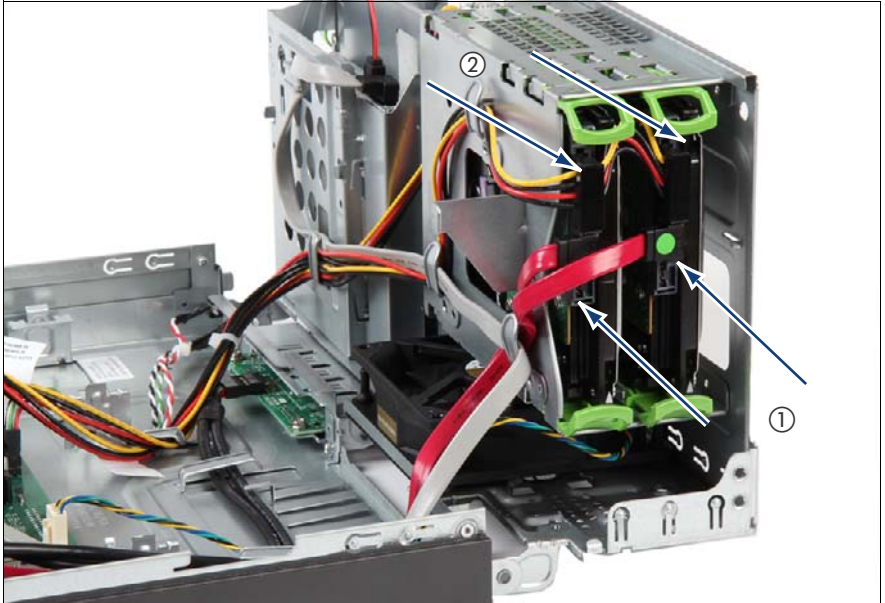
Figure 28: Disconnecting the cables from the a 3.5-inch HDD

▶ Disconnect the power cable (2) and data cable (1).
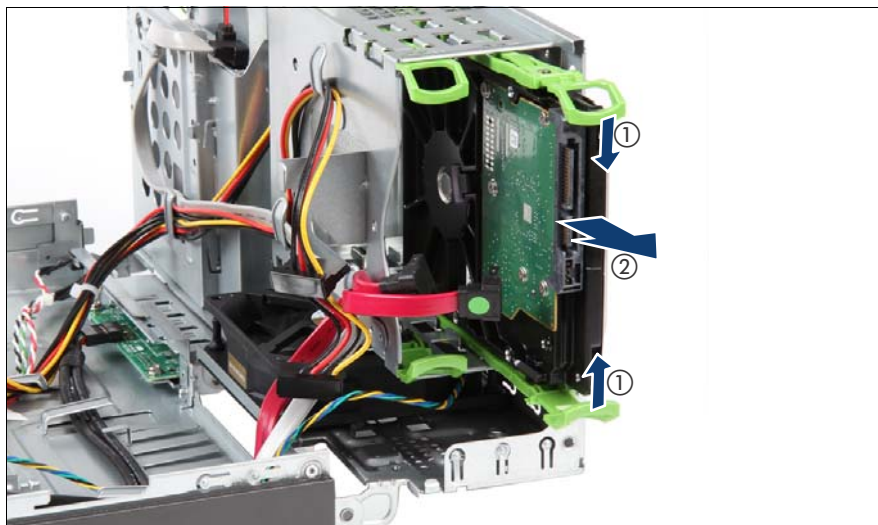
Figure 29: Removing a 3.5-inch HDD

► Pull the two green handles of the Easy rails in the direction of arrow 1.

► Pull the HDD with the two green handles of the Easy rails completely out of its bay (2).

Figure 30: Inserting the Easy rails

► Insert the Easy rails into the bay.

7.4.4   Concluding steps

Perform the following procedures to complete the task:

▶ Close the front cage as described in section "Closing the front cage" on page 53.

▶ Follow all procedures described in section "Closing the server" on page 54.

7.5   Installing additional 3.5-inch HDD in 3.5-inch chassis bay

Upgrade and Repair Units (URU)

Average task duration: 5 minutes

7.5.1   Required tools

● Preliminary and concluding steps: tool-less

● Installing a 3.5-inch HDD

    – Phillips PH2 / (+) No. 2 screw driver

7.5.2   Preliminary steps

Before installing a 3.5-inch HDD, perform the following steps:

▶ Follow all procedures described in section "Opening the server" on page 48.

▶ Open the front cage as described in section "Opening the front cage" on page 52.

▶ Locate the correct drive bay as described in section "Mounting order" on page 82.

7.5.3   Installing an additional 3.5-inch HDD in 3.5-inch chassis bay
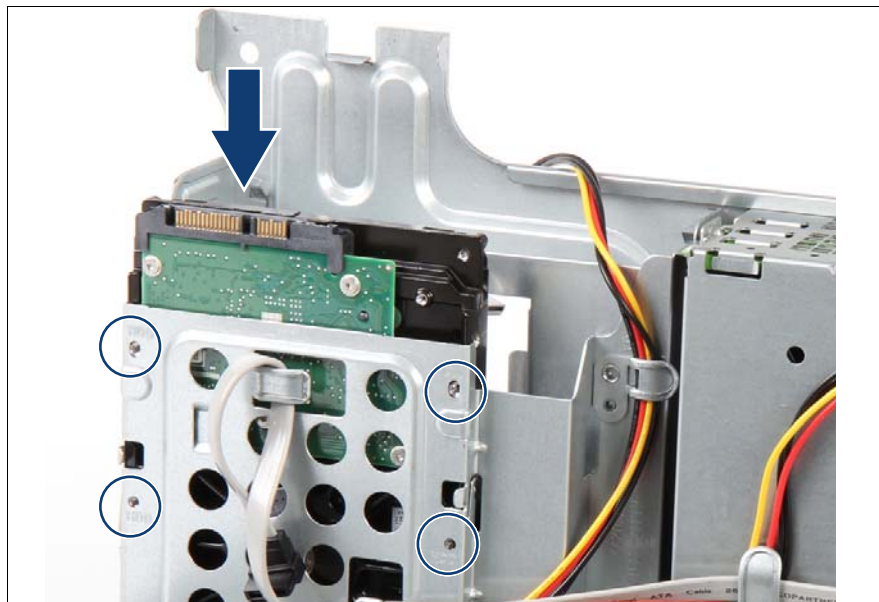
Figure 31: Installing the HDD in 3.5-inch chassis bay

► Insert the HDD into the drive bay and fasten the four screws (see circles).
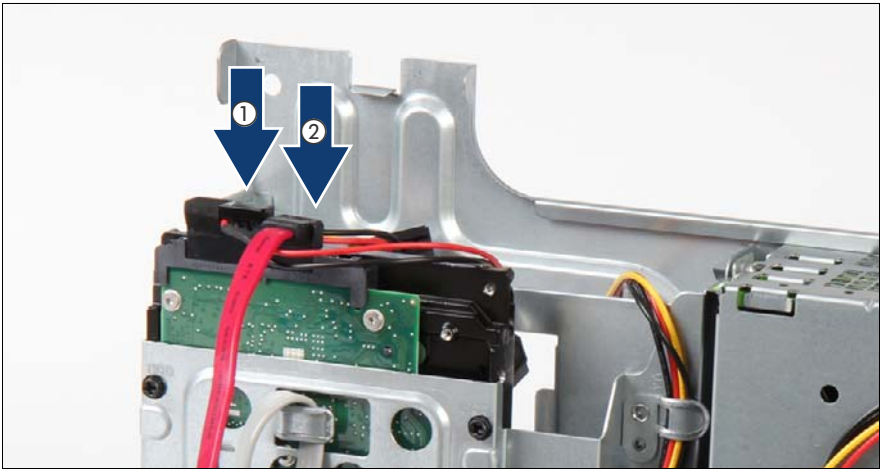
Figure 32: Connecting the cables to the HDD

► Connect cables to the HDD.

1 Power cable connector P3 (see "Power cable T26139-Y4012-V211" on page 239)

2 SATA cable T26139-Y4028-V153

7.5.4 Concluding steps

Perform the following procedures to complete the task:

► Close the front cage as described in section "Closing the front cage" on page 53.

► Follow all procedures described in section "Closing the server" on page 54.

► Please observe the notes on RAID rebuild in section "Performing a RAID array rebuild" on page 67.

7.6 Removing additional 3.5-inch HDD out of 3.5-inch chassis bay

7.6.1 Required tools

● Preliminary and concluding steps: tool-less

● Installing a 3.5-inch HDD

– Phillips PH2 / (+) No. 2 screw driver

7.6.2 Preliminary steps

Before installing a 3.5-inch HDD, perform the following steps:

► Follow all procedures described in section "Opening the server" on page 48.

► Open the front cage as described in section "Opening the front cage" on page 52.

► Locate the correct drive bay as described in section "Mounting order" on page 82.

7.6.3 Removing an additional 3.5-inch HDD out of 3.5-inch chassis bay

Figure 33: Disconnecting the cables from the HDD

► Disonnect cables from the HDD.

1 Power cable connector P3 (see "Power cable T26139-Y4012-V211" on page 239)

2 SATA cable T26139-Y4028-V153

Figure 34: Removing the HDD from 3.5-inch chassis bay

► Remove the four screws (see circles) and remove the HDD from the drive bay.

7.6.4   Concluding steps

Perform the following procedures to complete the task:

► Close the front cage as described in section "Closing the front cage" on page 53.

► Follow all procedures described in section "Closing the server" on page 54.

7.7 Installing additional 3.5-inch HDD in 5.25-inch dummy cover

7.7.1 Required tools

● Preliminary and concluding steps: tool-less

● Installing a 3.5-inch HDD

– Phillips PH2 / (+) No. 2 screw driver

7.7.2 Preliminary steps

Before installing a 3.5-inch HDD, perform the following steps:

► Follow all procedures described in section "Opening the server" on page 48.

► Locate the correct drive bay as described in section "Mounting order" on page 82.

► Remove the 5.25-inch dummy cover as described in section "Removing a 5.25-inch dummy cover" on page 113.

7.7.3 Installing a 3.5-inch HDD in 5.25-inch dummy cover

Figure 35: Installing the HDD in the 5.25-inch dummy cover

► Insert the HDD into the 5.25-inch dummy cover (1) and fasten the four screws (2).

Figure 36: Connecting the fixation plate to the 5.25-inch dummy cover

► Align the four pins of the fixation plate with the screw holes on the 5.25-inch dummy cover.
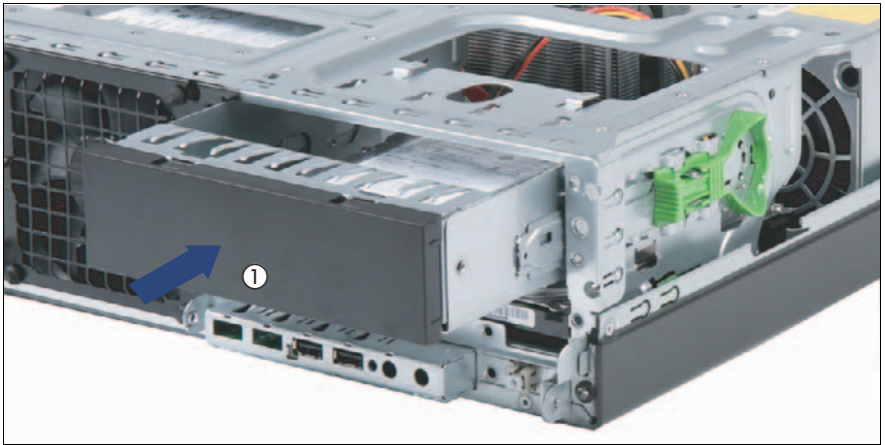
Figure 37: Installing the 5.25-inch dummy cover with HDD into the chassis bay

► Insert the 5.25-inch dummy cover with HDD in the bay (1) until it snaps into place.

► Open the front cage as described in section "Opening the front cage" on page 52.

Figure 38: Connecting the cables to the HDD

► Connect cables to the HDD.

1   Power cable connector P2 (see "Power cable T26139-Y4012-V211" on page 239)

2   SATA cable T26139-Y4028-V153

7.7.4   Concluding steps

Perform the following procedures to complete the task:

► Close the front cage as described in section "Closing the front cage" on page 53.

► Follow all procedures described in section "Closing the server" on page 54.

► Please observe the notes on RAID rebuild in section "Performing a RAID array rebuild" on page 67.

7.8   Removing 3.5-inch HDD out of 5.25-inch dummy cover

7.8.1   Required tools

● Preliminary and concluding steps: tool-less

● Installing a 3.5-inch HDD

– Phillips PH2 / (+) No. 2 screw driver

7.8.2   Preliminary steps

Before removing a 3.5-inch HDD, perform the following steps:

► Follow all procedures described in section "Opening the server" on page 48.

► Open the front cage as described in section "Opening the front cage" on page 52.

► Locate the correct drive bay as described in section "Mounting order" on page 82.

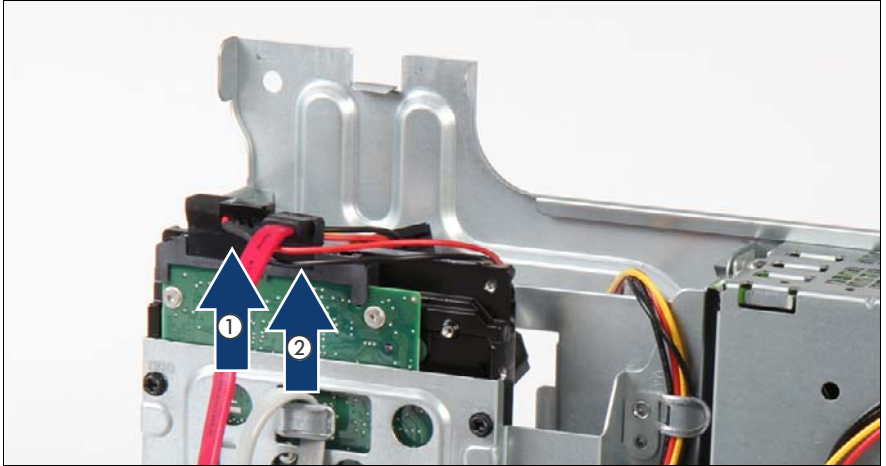## 7.8.3 Removing a 3.5-inch HDD out of 5.25-inch dummy cover
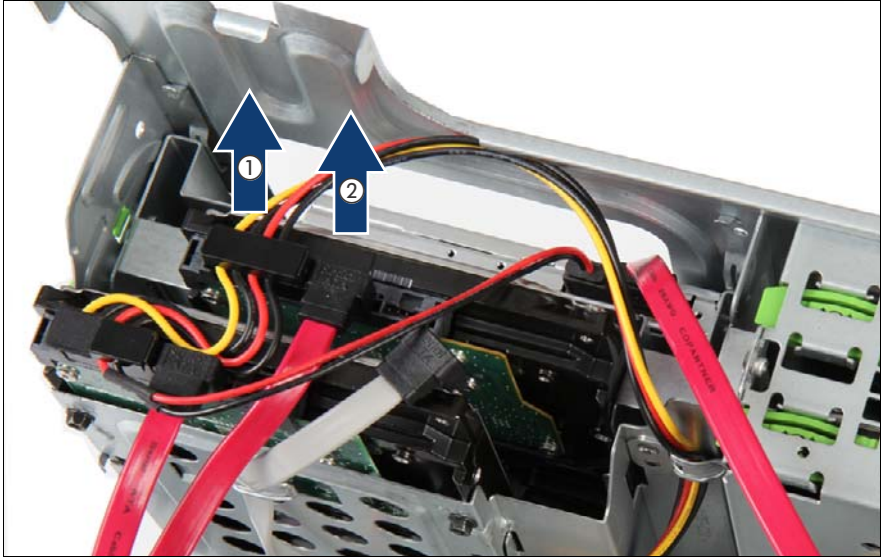
Figure 39: Disconnecting the cables from the HDD

▶ Disconnect cables from the HDD.

1 Power cable connector P2 (see "Power cable T26139-Y4012-V211" on page 239)
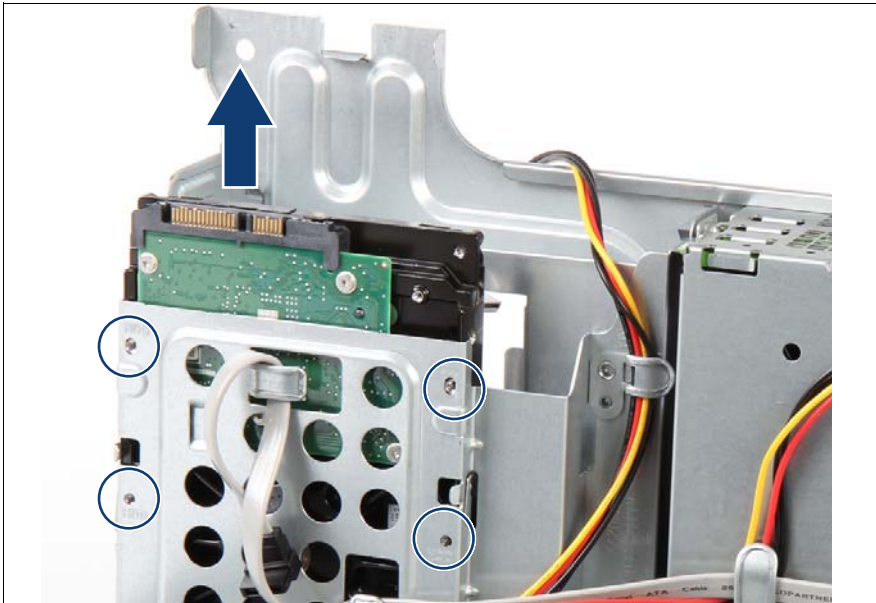
2 SATA cable T26139-Y4028-V153

▶ Close the front cage as described in section "Closing the front cage" on page 53.

Figure 40: Removing the 5.25-inch dummy cover with HDD out of the the chassis bay

► Push the green handle backward (1) and remove the 5.25-inch dummy cover with HDD out of the the bay (2).

Figure 41: Removing the HDD out of the 5.25-inch dummy cover

► Remove the four screws (1) and remove the HDD out of the 5.25-inch dummy cover (2).

⚠️ **CAUTION!**

Always replace dummy modules into unused drive bays to comply with applicable EMC regulations and satisfy cooling requirements.

7.8.4 Concluding steps

Perform the following procedures to complete the task:

► Install the 5.25-inch dummy cover as described in section "Installing 5.25-inch dummy cover" on page 110.

► Follow all procedures described in section "Closing the server" on page 54.

7.9 Installing additional 3.5-inch HDD in 5.25-inch ODD/HDD bracket

7.9.1 Required tools

● Preliminary and concluding steps: tool-less

● Installing a 3.5-inch HDD

– Phillips PH2 / (+) No. 2 screw driver

7.9.2 Preliminary steps

Before installing a 3.5-inch HDD, perform the following steps:

► Follow all procedures described in section "Opening the server" on page 48.

► Locate the correct drive bay as described in section "Mounting order" on page 82.

► Remove the 5.25-inch dummy cover as described in section "Removing a 5.25-inch dummy cover" on page 113.

7.9.3 Installing an additional 3.5-inch HDD in ODD/HDD bracket
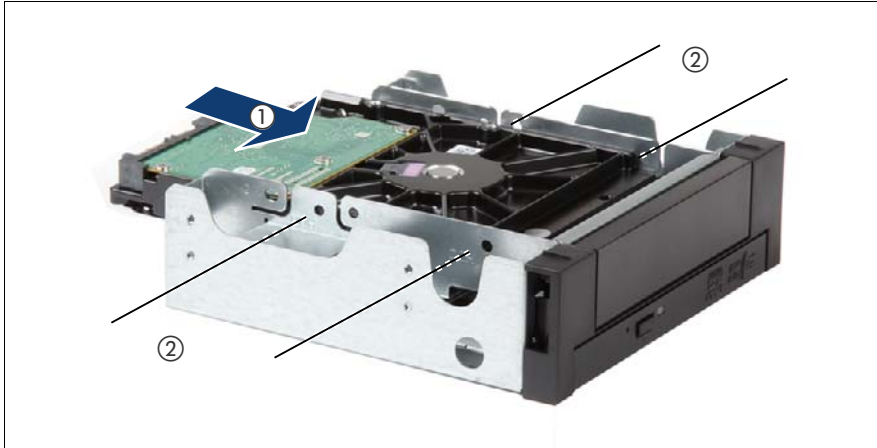
Figure 42: Installing the HDD in the 5.25-inch ODD/HDD bracket

► Insert the HDD into the ODD/HDD bracket (1) and fasten the four screws (2).

Figure 43: Connecting the fixation plate to the 5.25-inch ODD/HDD bracket

► Align the four pins of the fixation plate with the screw holes on the ODD/HDD bracket.

Figure 44: Inserting ODD/HDD bracket in 5.25-inch chassis bay

▶ Insert the ODD/HDD bracket in the bay (1) until it snaps into place.

▶ Open the front cage as described in section "Opening the front cage" on page 52.
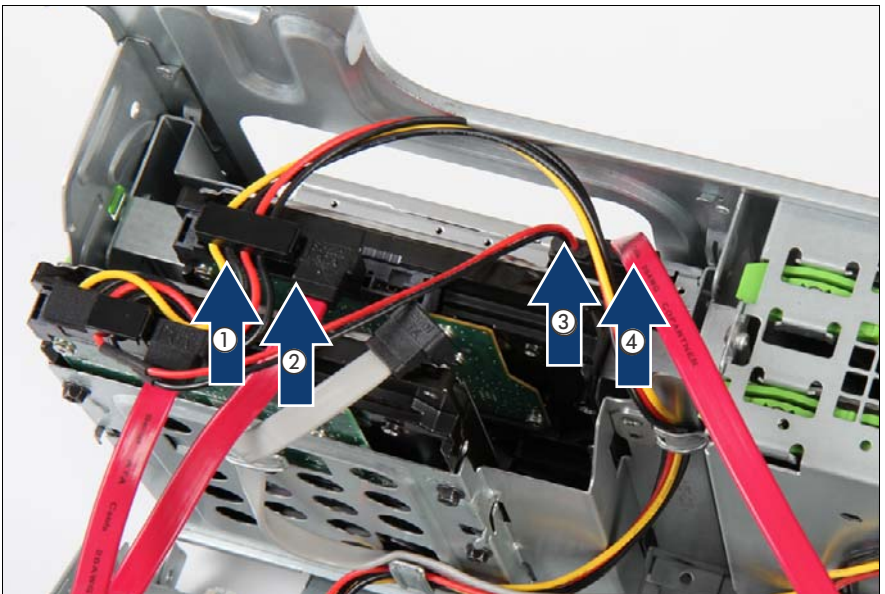
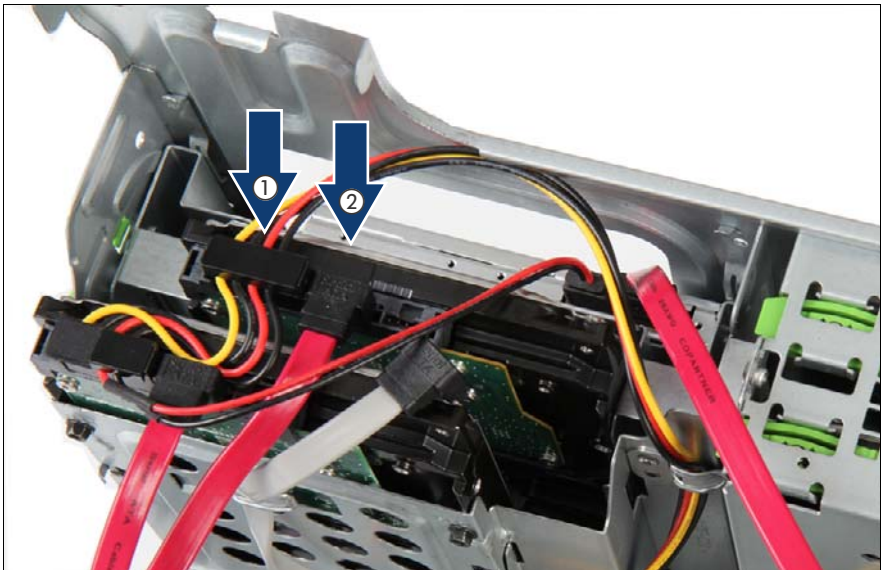Figure 45: Cabling of HDD and ODD in 5.25-inch ODD/HDD bracket

▶ Connect cables to the HDD.

    1   Power cable connector P2 (see "Power cable T26139-Y4012-V211" on page 239)

    2   SATA cable T26139-Y4028-V153

▶ Connect cables to the ODD.

    3   Power cable connector P4 (see "Power cable T26139-Y4012-V211" on page 239)

    4   SATA cable T26139-Y4028-V201

7.9.4   Concluding steps

Perform the following procedures to complete the task:

▶ Close the front cage as described in section "Closing the front cage" on page 53.

▶ Follow all procedures described in section "Closing the server" on page 54.

▶ Please observe the notes on RAID rebuild in section "Performing a RAID array rebuild" on page 67.

7.10   Removing 3.5-inch HDD out of 5.25-inch ODD/HDD bracket

7.10.1   Required tools

● Preliminary and concluding steps: tool-less

● Installing a 3.5-inch HDD

    – Phillips PH2 / (+) No. 2 screw driver

7.10.2 Preliminary steps

Before installing a 3.5-inch HDD, perform the following steps:

► Follow all procedures described in section "Opening the server" on page 48.

► Open the front cage as described in section "Opening the front cage" on page 52.

► Locate the correct drive bay as described in section "Mounting order" on page 82.

## 7.10.3 Removing an additional 3.5-inch HDD out of the 5.25-inch ODD/HDD bracket
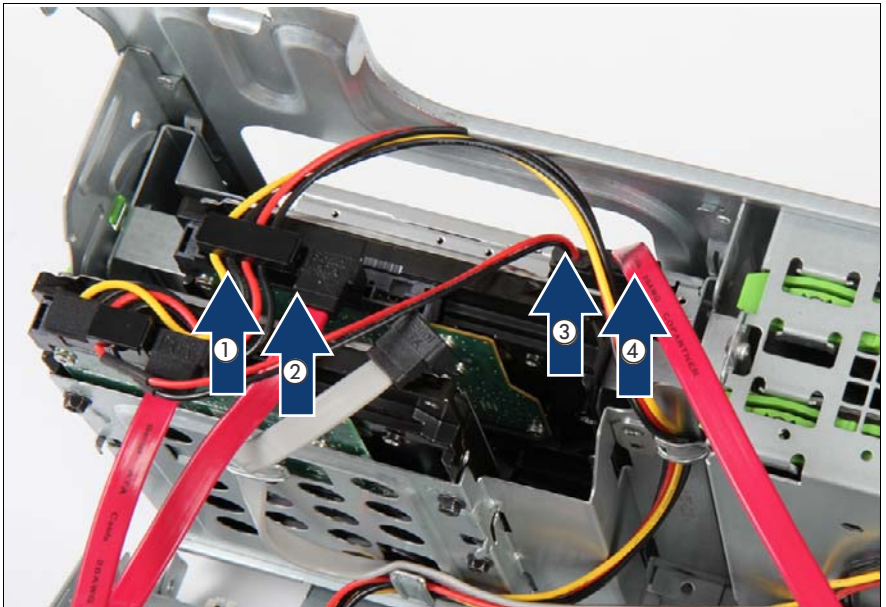
Figure 46: Cabling of HDD and ODD in 5.25-inch ODD/HDD bracket

► Disconnect cables to the HDD.

1 Power cable connector P2 (see "Power cable T26139-Y4012-V211" on page 239)

2 SATA cable T26139-Y4028-V153

► Disconnect cables to the ODD.

3   Power cable connector P4 (see "Power cable T26139-Y4012-V211" on page 239)

4   SATA cable T26139-Y4028-V201

► Close the front cage as described in section "Closing the front cage" on page 53.

Figure 47: Removing the 5.25-inch ODD/HDD bracket

► Push the green handle backward (1) and pull the ODD/HDD bracket out of its bay (2).

⚠ **CAUTION!**

Always replace dummy modules into unused drive bays to comply with applicable EMC regulations and satisfy cooling requirements.

Figure 48: Removing the fixation plate from the 5.25-inch ODD/HDD bracket

► Remove the fixation plate from the 5.25-inch ODD/HDD bracket.
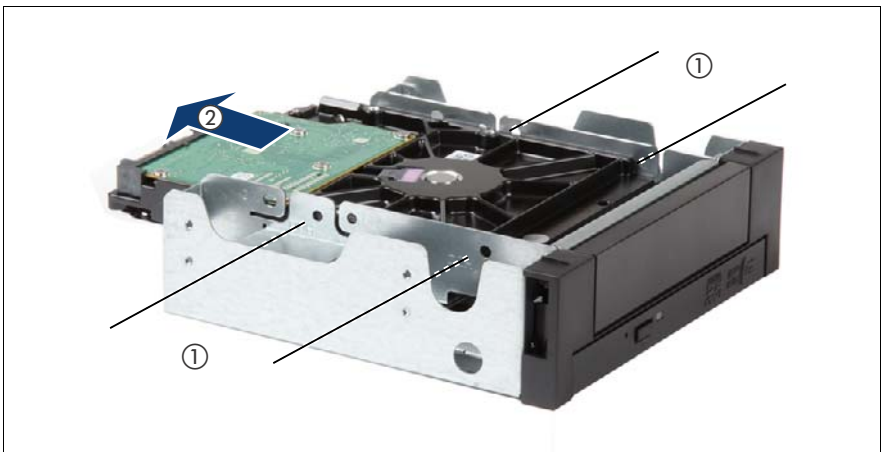
Figure 49: Removing the HDD out of the 5.25-inch ODD/HDD bracket

► Remove the four screws (1) and pull the HDD out of the 5.25-inch ODD/HDD bracket (2).

7.10.4 Concluding steps

Perform the following procedures to complete the task:

▶ Install the 5.25-inch dummy cover as described in section "Installing 5.25-inch dummy cover" on page 110.

▶ Follow all procedures described in section "Closing the server" on page 54.

7.11   Installing 5.25-inch dummy cover

7.11.1 Required tools

● Preliminary and concluding steps: tool-less

● Removing the dummy cover: tool-less

7.11.2 Preliminary steps

Before installing the dummy cover, perform the following steps:

▶ Follow all procedures described in section "Opening the server" on page 48.

7.11.3 Installing a 5.25-inch dummy cover

Figure 50: Connecting the fixation plate to the 5.25-inch dummy cover

► Align the four pins of the fixation plate with the screw holes on the 5.25-inch dummy cover.
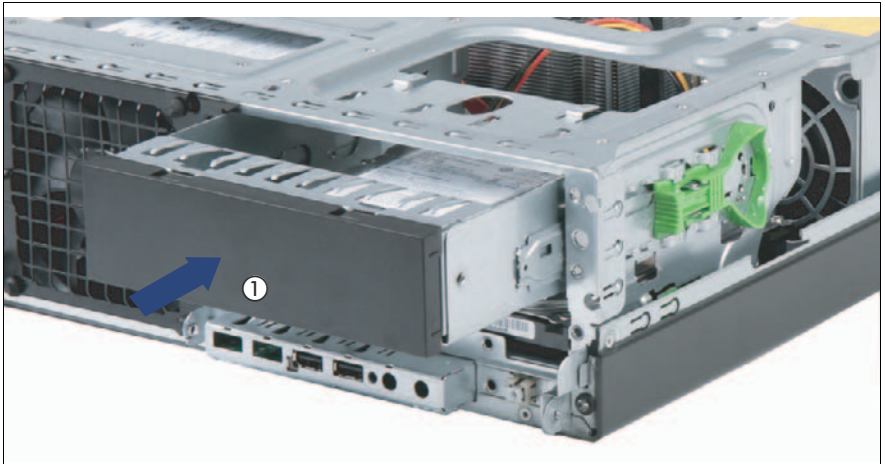
Figure 51: Installing the 5.25-inch dummy cover

► Insert the dummy cover in the bay (1) until it snaps into place.

7.11.4 Concluding steps

Perform the following procedures to complete the task:

▶ Follow all procedures described in section "Closing the server" on page 54.

7.12   Removing 5.25-inch dummy cover

🔧 **Upgrade and Repair Units (URU)**

🕐 **Average task duration: 5 minutes**

7.12.1 Required tools

● Preliminary and concluding steps: tool-less

● Removing the dummy cover: tool-less

7.12.2 Preliminary steps

Before removing the dummy cover, perform the following steps:

▶ Follow all procedures described in section "Opening the server" on page 48.

7.12.3   Removing a 5.25-inch dummy cover

Figure 52: Removing the 5.25-inch dummy cover

► Push the green handle backward (1) and pull the dummy cover out of its bay (2).

⚠ **CAUTION!**
   Always replace dummy modules into unused drive bays to comply with applicable EMC regulations and satisfy cooling requirements.

Figure 53: Removing the fixation plate of the 5.25-inch dummy cover

► Remove the fixation plate from the dummy cover.

⚠ **CAUTION!**

Save the fixation plate for future use.
You have to install the fixation plate to the different drive cages before installation.

7.12.4 Concluding steps

Perform the following procedures to complete the task:

► Install the 5.25-inch dummy cover as described in section "Installing 5.25-inch dummy cover" on page 110.

► Follow all procedures described in section "Closing the server" on page 54.

7.13 Installing ODD in 5.25-inch chassis bay

7.13.1 Required tools

- Preliminary and concluding steps: tool-less
- Installing ODD: tool-less

7.13.2 Preliminary steps

Before installing an ODD, perform the following steps:

► Disable BitLocker functionality as described in section "Disabling BitLocker functionality" on page 59.

► Follow all procedures described in section "Opening the server" on page 48.

► Locate the correct drive bay as described in section "Mounting order" on page 82.

► Remove the dummy cover as described in section "Removing 5.25-inch dummy cover" on page 112.

7.13.3   Installing an ODD in 5.25-inch chassis bay

► Connect the fixation plate to the ODD.

Figure 54: Installing HH ODD

► Insert the half-height ODD in the bay (1) until it snaps into place.

► Open the front cage as described in section "Opening the front cage" on page 52.
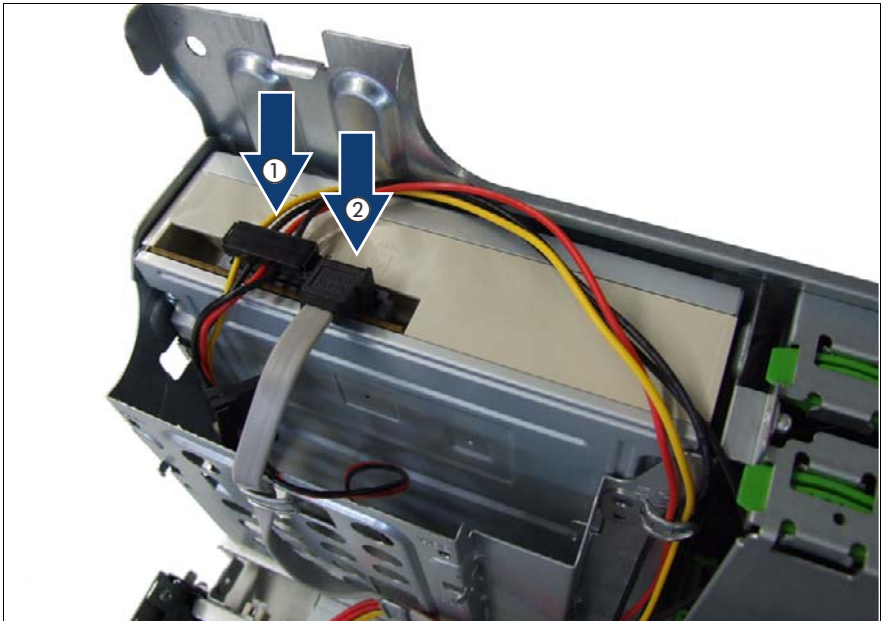
Figure 55: Connecting cables to the HH ODD

► Connect cables to the HH ODD.

1 Power cable connector P2 (see "Power cable T26139-Y4012-V211" on page 239)

2 SATA cable T26139-Y4028-V102

7.13.4 Concluding steps

Perform the following procedures to complete the task:

► Close the front cage as described in section "Closing the front cage" on page 53.

► Follow all procedures described in section "Closing the server" on page 54.

► If BitLocker functionality is used and has been disabled before starting the maintenance task, re-enable BitLocker as described in section "Enabling BitLocker functionality" on page 66.

7.14 Removing ODD out of 5.25-inch chassis bay

7.14.1 Required tools

● Preliminary and concluding steps: tool-less

● Installing an ODD: tool-less

7.14.2 Preliminary steps

Before removing an ODD, perform the following steps:

► Disable BitLocker functionality as described in section "Disabling BitLocker functionality" on page 59.

► Remove all backup and optical disk media from backup and optical disk drives as described in section "Removing backup and optical disk media" on page 60.

► Follow all procedures described in section "Opening the server" on page 48.

► Open the front cage as described in section "Opening the front cage" on page 52.

► Locate the correct drive bay as described in section "Mounting order" on page 82.

7.14.3   Removing an ODD out of 5.25-inch chassis bay
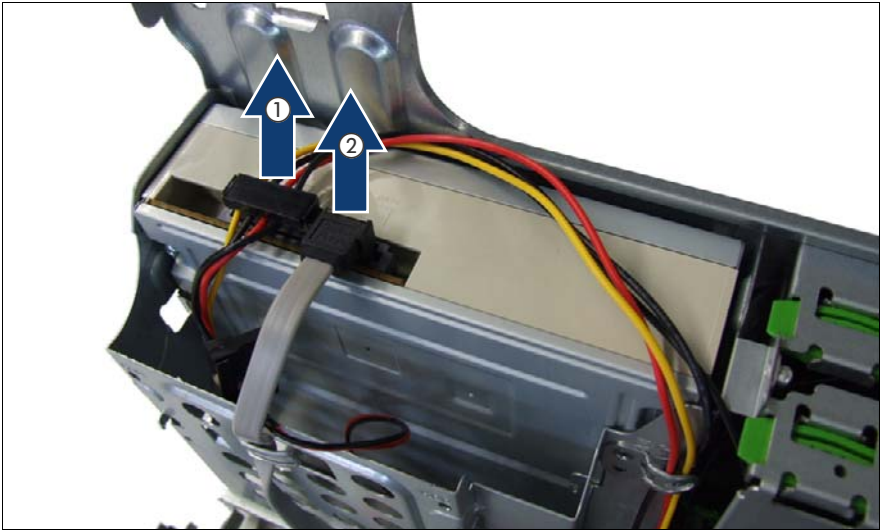
Figure 56: Disconnecting cables of the HH ODD

► Disconnect cables of the HH ODD.

1   Power cable connector P2 (see "Power cable T26139-Y4012-V211" on page 239)

2   SATA cable T26139-Y4028-V102

► Close the front cage as described in section "Closing the front cage" on page 53.

Figure 57: Removing HH ODD

► Push the green handle backward (1) and pull the half-height ODD out of the bay (2).

► Disconnect the fixation plate from the HH ODD cage.

⚠ **CAUTION!**

Always replace dummy modules into unused drive bays to comply with applicable EMC regulations and satisfy cooling requirements.
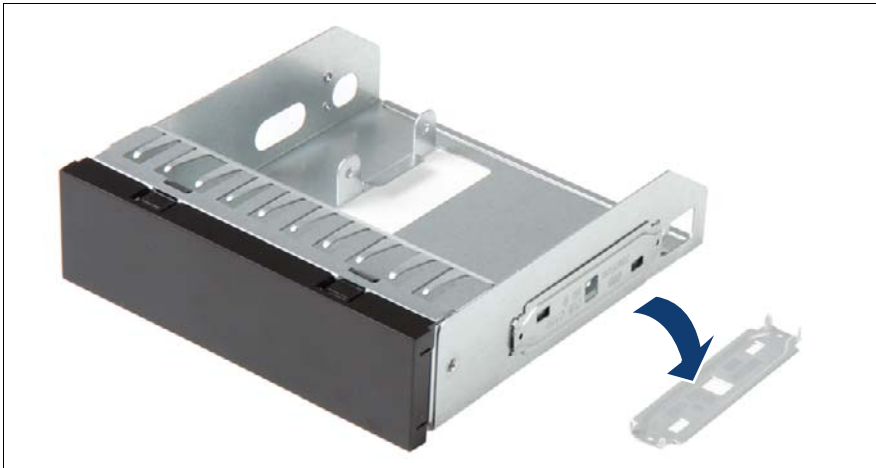
7.14.4   Concluding steps

Perform the following procedures to complete the task:

► Install the 5.25-inch dummy cover as described in section "Installing 5.25-inch dummy cover" on page 110.

► Follow all procedures described in section "Closing the server" on page 54.

► If BitLocker functionality is used and has been disabled before starting the maintenance task, re-enable BitLocker as described in section "Enabling BitLocker functionality" on page 66.

7.15 Installing slimline ODD in 5.25-inch ODD/HDD bracket

7.15.1 Required tools

● Preliminary and concluding steps: tool-less

● Installing a slimline ODD:

– EMEA: Torx Plus Size 6

– Japan: Philips (+) No.00 screw driver

7.15.2 Preliminary steps

Before installing a slimline ODD, perform the following steps:

► Disable BitLocker functionality as described in section "Disabling BitLocker functionality" on page 59.

► Follow all procedures described in section "Opening the server" on page 48.

► Locate the correct drive bay as described in section "Mounting order" on page 82.

► Remove the dummy cover as described in section "Removing 5.25-inch dummy cover" on page 112.

7.15.3 Installing a slimline ODD in 5.25-inch ODD/HDD bracket
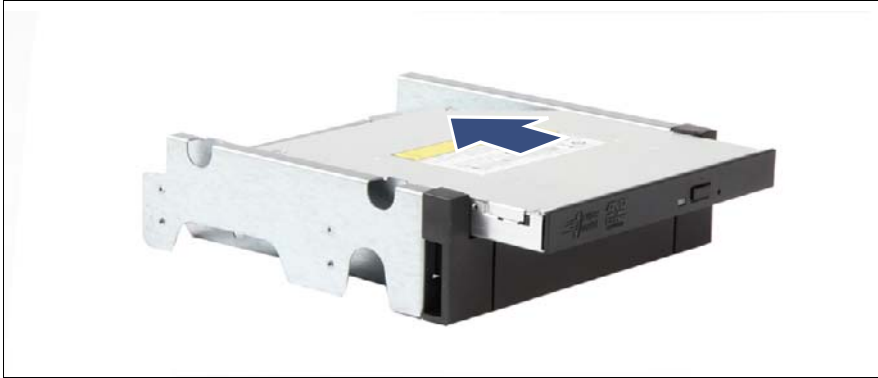
Figure 58: Installing the ODD in the 5.25-inch ODD/HDD bracket

► Insert the ODD into its installation bay and carefully push in until the screw holes are matching.

Figure 59: Fastening the screws

► Fasten the three screws.

Figure 60: Connecting the fixation plate to the 5.25-inch ODD/HDD bracket

▶ Align the four pins of the fixation plate with the screw holes on the 5.25-inch ODD/HDD bracket.

Figure 61: Installing the 5.25-inch ODD/HDD bracket with the slimline ODD

▶ Insert the 5.25-inch ODD/HDD bracket with the ODD in the bay (1) until it snaps into place.

► Open the front cage as described in section "Opening the front cage" on page 52.
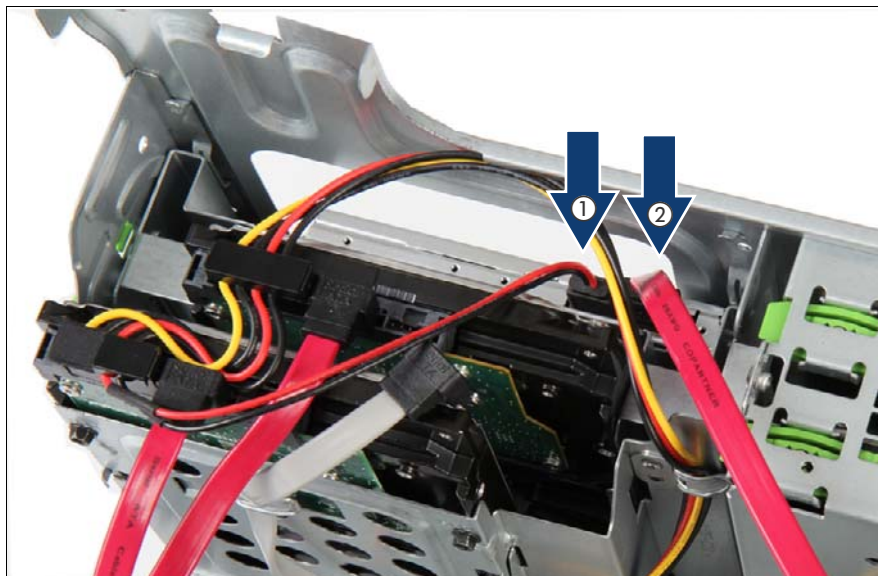
Figure 62: Connecting cables of the slimline ODD in 5.25-inch ODD/HDD bracket

► Connect cables to the slimline ODD.

1   Power cable connector P4 (see "Power cable T26139-Y4012-V211" on page 239)

2   SATA cable T26139-Y4028-V201

7.15.4 Concluding steps

Perform the following procedures to complete the task:

► Close the front cage as described in section "Closing the front cage" on page 53.

► Follow all procedures described in section "Closing the server" on page 54.

► If BitLocker functionality is used and has been disabled before starting the maintenance task, re-enable BitLocker as described in section "Enabling BitLocker functionality" on page 66.

7.16 Removing slimline ODD out of 5.25-inch ODD/HDD bracket

7.16.1 Required tools

● Preliminary and concluding steps: tool-less

● Removing a slimline ODD

   – EMEA: Torx Plus Size 6

   – Japan: Philips (+) No.00 screw driver

7.16.2 Preliminary steps

Before removing a slimline ODD, perform the following steps:

► Disable BitLocker functionality as described in section "Disabling BitLocker functionality" on page 59.

► Remove all backup and optical disk media from backup and optical disk drives as described in section "Removing backup and optical disk media" on page 60.

► Follow all procedures described in section "Opening the server" on page 48.

► Open the front cage as described in section "Opening the front cage" on page 52.

► Locate the correct drive bay as described in section "Mounting order" on page 82.

7.16.3 Removing a slimline ODD out of 5.25-inch ODD/HDD bracket
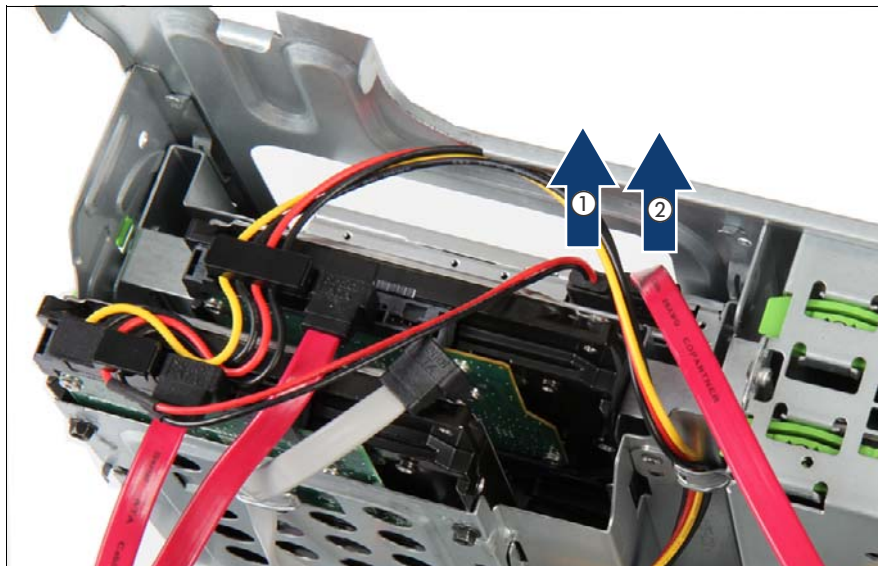
Figure 63: Disconnecting cables of the slimline ODD in 5.25-inch ODD/HDD bracket

► Disconnect cables to the slimline ODD.

1 Power cable connector P4 (see "Power cable T26139-Y4012-V211" on page 239)

2 SATA cable T26139-Y4028-V201

► Close the front cage as described in section "Closing the front cage" on page 53.

Figure 64: Removing the 5.25-inch ODD/HDD bracket with the slimline ODD

► Push the green handle backward (1) and pull the 5.25-inch ODD/HDD bracket out of its bay (2).

⚠ **CAUTION!**

Always replace dummy modules into unused drive bays to comply with applicable EMC regulations and satisfy cooling requirements.

Figure 65: Removing the screws

► Remove the three screws.
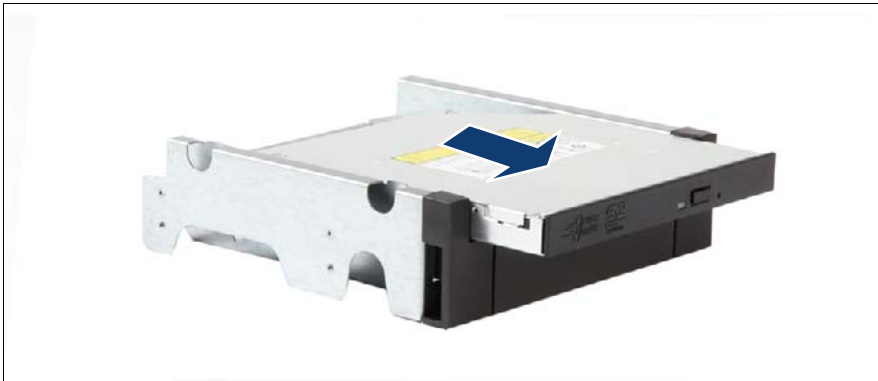
Figure 66: Removing the ODD out of the 5.25-inch ODD/HDD bracket

► Remove the ODD from its installation bay.

Figure 67: Removing the fixation plate of the 5.25-inch ODD/HDD bracket

► Remove the fixation plate from the 5.25-inch ODD/HDD bracket.

7.16.4 Concluding steps

Perform the following procedures to complete the task:

► Install the 5.25-inch dummy cover as described in section "Installing 5.25-inch dummy cover" on page 110.

► Follow all procedures described in section "Closing the server" on page 54.

► If BitLocker functionality is used and has been disabled before starting the maintenance task, re-enable BitLocker as described in section "Enabling BitLocker functionality" on page 66.

7.17 Installing backup drive in 5.25-inch chassis bay

🔧 **Upgrade and Repair Units (URU)**

🕐 **Average task duration: 10 minutes**

7.17.1 Required tools

● Preliminary and concluding steps: tool-less

● Removing accessible drives: tool-less

7.17.2 Preliminary steps

Before installing an accessible drive, perform the following steps:

▶ Disable BitLocker functionality as described in section "Disabling BitLocker functionality" on page 59.

▶ Follow all procedures described in section "Opening the server" on page 48.

▶ Remove the dummy cover as described in section "Removing 5.25-inch dummy cover" on page 112.

7.17.3 Installing a backup drive in 5.25-inch chassis bay

Figure 68: Connecting the fixation plate to the 5.25-inch chassis bay

► Align the four pins of the fixation plate with the screw holes on the 5.25-inch chassis bay.

Figure 69: Installing the backup drive

► Push the backup drive in its bay until it snaps into place.

► Open the front cage as described in section "Opening the front cage" on page 52.
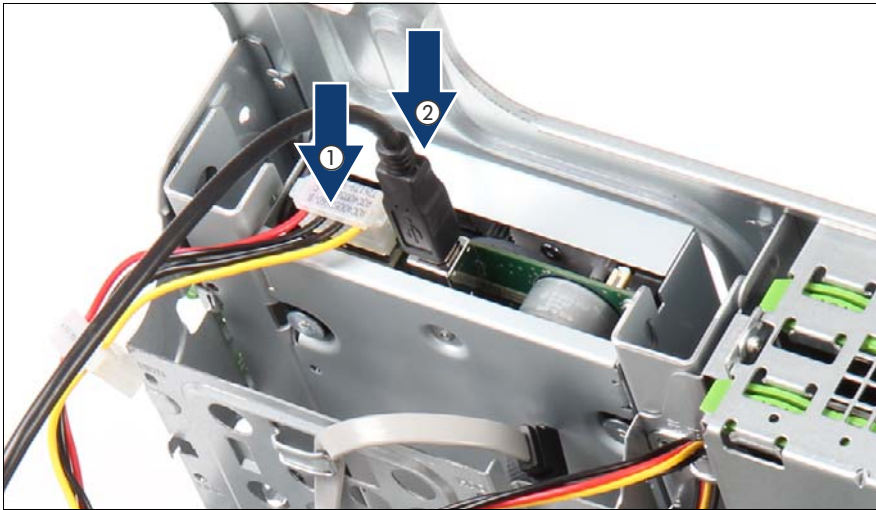
Figure 70: Connecting cables to the backup drive

► Connect cables to the backup drive.

  1 Connect the power connector P2 (see "Power cable T26139-Y4012-V211" on page 239) to the power adapter cable SNP:A3C40057660 and then connect the adapter cable to the backup drive.

  2 USB cable T26139-Y3973-V401.

► Connect the USB cable to the system board connector USB-FRONT3/4.

7.17.4 Concluding steps

Perform the following procedures to complete the task:

► Close the front cage as described in section "Closing the front cage" on page 53.

► Follow all procedures described in section "Closing the server" on page 54.

► Verify if your backup software solution requires additional configuration after installing, removing or replacing an accessible drive as described in section "Verifying and configuring the backup software solution" on page 64.

► If BitLocker functionality is used and has been disabled before starting the maintenance task, re-enable BitLocker as described in section "Enabling BitLocker functionality" on page 66.

7.18 Removing backup drive out of 5.25-inch chassis bay

7.18.1 Required tools

● Preliminary and concluding steps: tool-less

● Removing a backup drive: tool-less

7.18.2 Preliminary steps

Before removing a backup drive, perform the following steps:

► Disable BitLocker functionality as described in section "Disabling BitLocker functionality" on page 59.

► Remove all backup and optical disk media from backup and optical disk drives as described in section "Removing backup and optical disk media" on page 60.

► Verify if your backup software solution requires preparative configuration before starting the procedure as described in section "Verifying and configuring the backup software solution" on page 61.

► Follow all procedures described in section "Opening the server" on page 48.

► Open the front cage as described in section "Opening the front cage" on page 52.

► Locate the correct drive bay as described in section "Mounting order" on page 82.

7.18.3 Removing backup drive out of 5.25-inch chassis bay
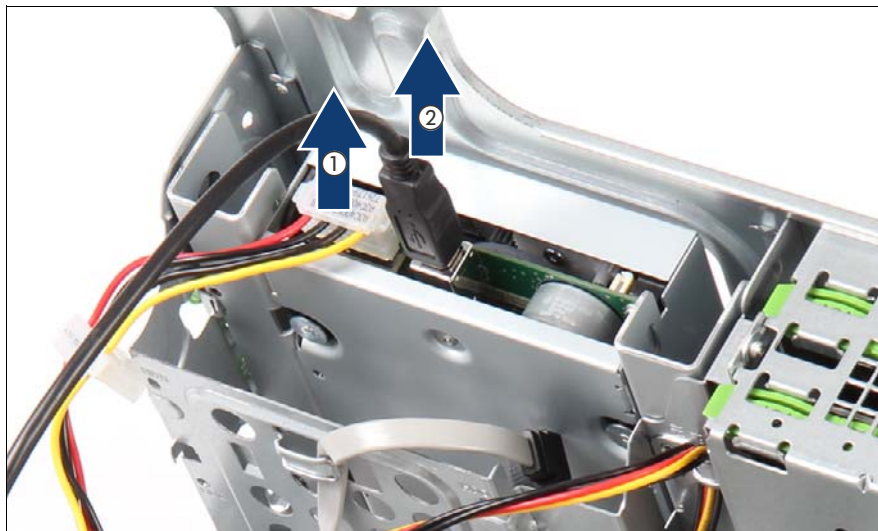
Figure 71: Disconnecting cables from the backup drive

► Disconnect all cables from the backup drive.

► Disconnect cables from the backup drive.

    1   Disconnect the adapter cable from the backup drive and then disconnect the power connector P2 (see "Power cable T26139-Y4012-V211" on page 239) from the power adapter cable SNP:A3C40057660.

    2   USB cable T26139-Y3973-V401.

► Remove the USB cable from the system board connector USB-FRONT3/4.

► Close the front cage as described in "Closing the front cage" on page 53.

Figure 72: Removing the backup drive

► Push the green handle backward (1) and pull the backup drive out of its bay (2).

⚠ **CAUTION!**

Always replace dummy modules into unused drive bays to comply with applicable EMC regulations and satisfy cooling requirements.

7.18.4 Concluding steps

Perform the following procedures to complete the task:

► Install the 5.25-inch dummy cover as described in section "Installing 5.25-inch dummy cover" on page 110.

► Follow all procedures described in section "Closing the server" on page 54.

► If BitLocker functionality is used and has been disabled before starting the maintenance task, re-enable BitLocker as described in section "Enabling BitLocker functionality" on page 66.

7.19 Installing slimline ODD in slimline chassis bay

🔧 **Upgrade and Repair Units (URU)**

🕐 **Average task duration: 10 minutes**

7.19.1 Required tools

- Preliminary and concluding steps:
    - Slotted screw driver (only for removing the ODD filler cover)
- Installing accessible drives: tool-less

7.19.2 Preliminary steps

Before installing an accessible drive, perform the following steps:

► Disable BitLocker functionality as described in section "Disabling BitLocker functionality" on page 59.

► Follow all procedures described in section "Opening the server" on page 48.

7.19.3 Removing the ODD filler cover

Figure 73: Removing the ODD filler cover

► Using a slotted screw driver, pry the ODD filler cover out of its bay and remove it from its installation bay.

⚠ **CAUTION!**

The ODD filler cover is not for future use. You cannot install the ODD filler cover again.
Do not pry out the ODD filler cover, if you do not install a slimline ODD.

7.19.4 Installing the ODD

Figure 74: Installing the ODD

► Attach the installation bracket to the ODD as shown.

Figure 75: Installing the ODD

► Ensure that the hooks on the installation bracket properly engage with the screw holes on the ODD (see circles).

Figure 76: Installing the ODD

► Insert the ODD in the bay until it snaps into place.

► Open the front cage as described in section "Opening the front cage" on page 52.
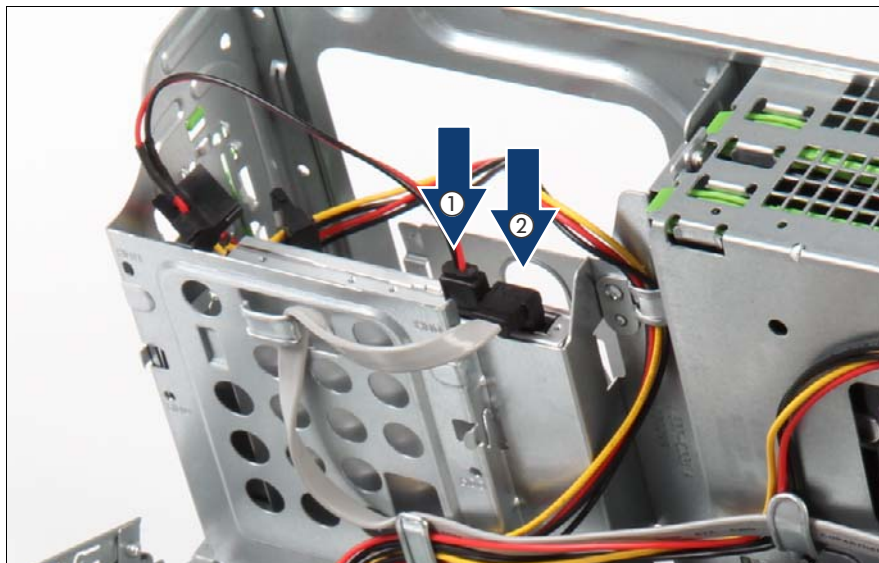
Figure 77: Connecting cables to the ODD

► Connect cables to the ODD.

1 Power cable connector P4 (see "Power cable T26139-Y4012-V211" on page 239)

2 SATA cable T26139-Y4028-V102
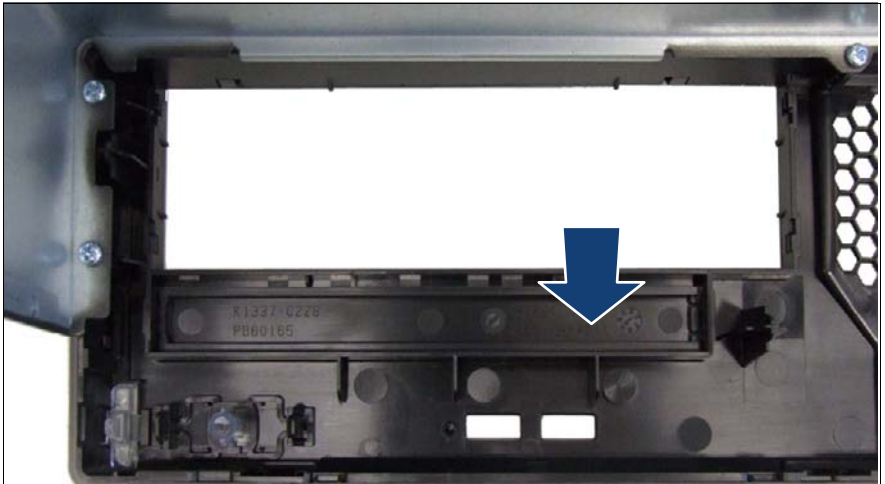
Figure 78: Removing the ODD cover

▶ Press the ODD cover out from inside to outside of the server cover.

▶ Remove the ODD cover

7.19.5 Concluding steps

Perform the following procedures to complete the task:

▶ Close the front cage as described in section "Closing the front cage" on page 53.

▶ Follow all procedures described in section "Closing the server" on page 54.

▶ If BitLocker functionality is used and has been disabled before starting the maintenance task, re-enable BitLocker as described in section "Enabling BitLocker functionality" on page 66.

7.20 Replacing slimline ODD out of slimline chassis bay

7.20.1 Required tools

● Preliminary and concluding steps:

● Removing accessible drives: tool-less

7.20.2 Preliminary steps

Before replacing an accessible drive, perform the following steps:

► Disable BitLocker functionality as described in section "Disabling BitLocker functionality" on page 59.

► Remove all backup and optical disk media from backup and optical disk drives as described in section "Removing backup and optical disk media" on page 60.

► Follow all procedures described in section "Opening the server" on page 48.

► Open the front cage as described in section "Opening the front cage" on page 52.

### 7.20.3 Replacing a slimline ODD out of slimline chassis bay
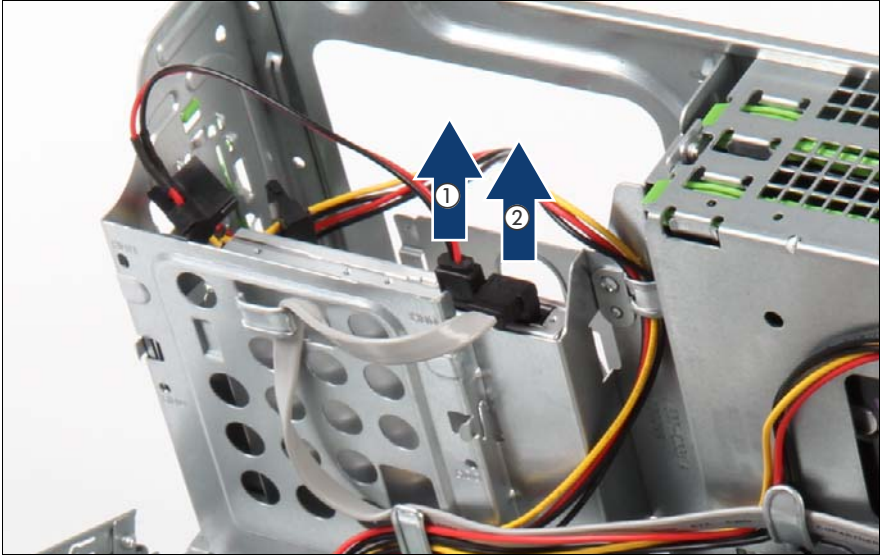
Figure 79: Disconnecting cables from the ODD

▶ Disconnect all cables from the ODD.

1 Power cable connector P4 (see "Power cable T26139-Y4012-V211" on page 239)

2 SATA cable T26139-Y4028-V102

▶ Close the front cage as described in "Closing the front cage" on page 53.
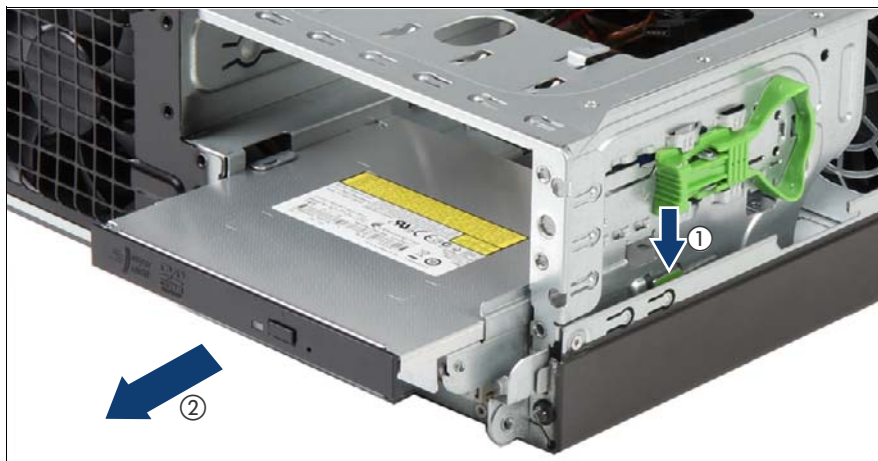
Figure 80: Removing the ODD

► Press the green locking (1) and pull the ODD out of its bay (2).

► Install a new ODD in this bay.

7.20.4 Concluding steps

Perform the following procedures to complete the task:

► Follow all procedures described in section "Closing the server" on page 54.

► If BitLocker functionality is used and has been disabled before starting the maintenance task, re-enable BitLocker as described in section "Enabling BitLocker functionality" on page 66.

8 System fan

Basic information

The PRIMERGY MX130 S2 server features one system fan module.

i Additional fans in PSU and processor heat sink cannot be replaced individually.

⚠ **CAUTION!**

Since the system fan is not redundant is has to be replaced immediately in case of defects or pre-failure events.

Safety notes

⚠ **CAUTION!**

● Do not damage or modify internal cables or devices. Doing so may cause a device failure, fire, or electric shock.

● Devices and components inside the server remain hot after shutdown. After shutting down the server, wait for hot components to cool down before installing or removing internal options.

● Circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. Always discharge static build-up (e.g. by touching a grounded object) before handling electrostatic-sensitive devices (ESDs).

● Do not touch the circuitry on boards or soldered parts. Hold circuit boards by their metallic areas or edges.

● If devices are installed or disassembled using methods other than those outlined in this chapter, the warranty will be invalidated.

● For further information, please refer to chapter "Important information" on page 31.

8.1 Replacing the system fan module

🔧 **Upgrade and Repair Units (URU)**

🕐 **Average task duration: 5 minutes**

8.1.1 Required tools

● Preliminary and concluding steps: tool-less

● Replacing the fan module:

– Side cutter / pincer

8.1.2 Preliminary steps

Before replacing the fan module, perform the following steps:

► Follow all procedures described in section "Opening the server" on page 48.

► Open the front cage as described in section "Opening the front cage" on page 52.

8.1.3   Removing the system fan module

Figure 81: Disconnecting the cable of the system fan module

► Disconnect the fan cable from system board connector FAN2.
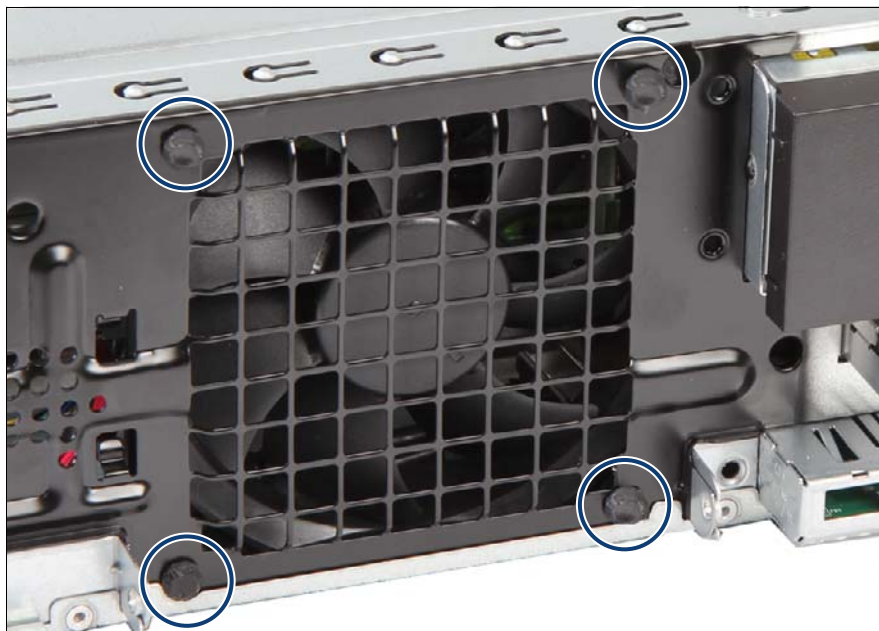
Figure 82: Cutting the front fan rivets

► Tear the front fan rivets a little out and cut them with a side cutter.
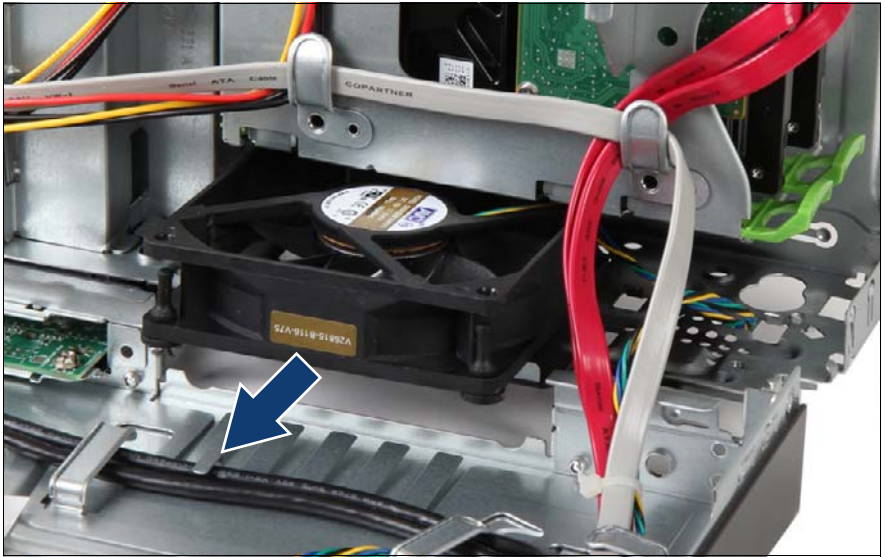
Figure 83: Removing the system fan module

► Pull the fan cable out of the chassis.

► Take the system fan module out from the chassis.

8.1.4   Installing the system fan module

Figure 84: Fitting the new system fan module with new front fan rivets

► Fit four new front fan rivets into the fan.
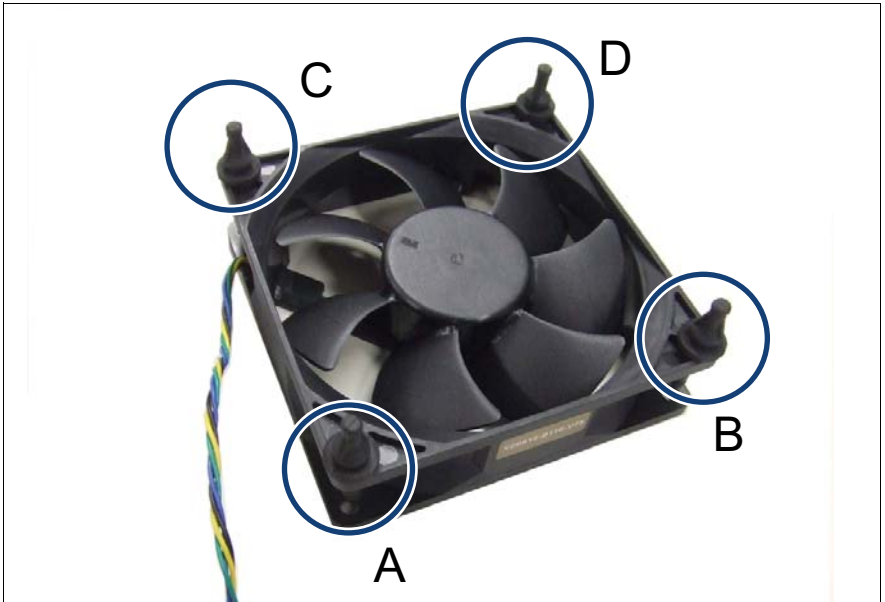
Figure 85: System fan with installed fan rivets

► The front system fan has four fan rivets A, B, C and D (see circles).
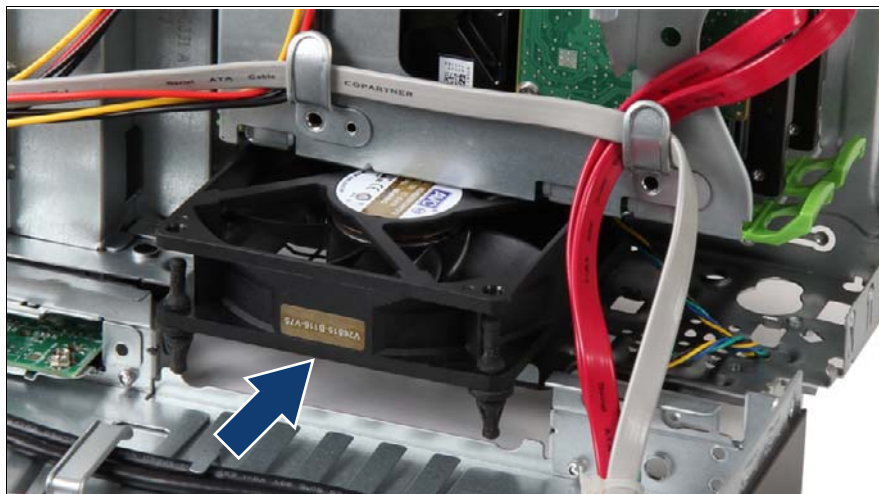
Figure 86: Installing the system fan module

► Insert the system fan module into the chassis.
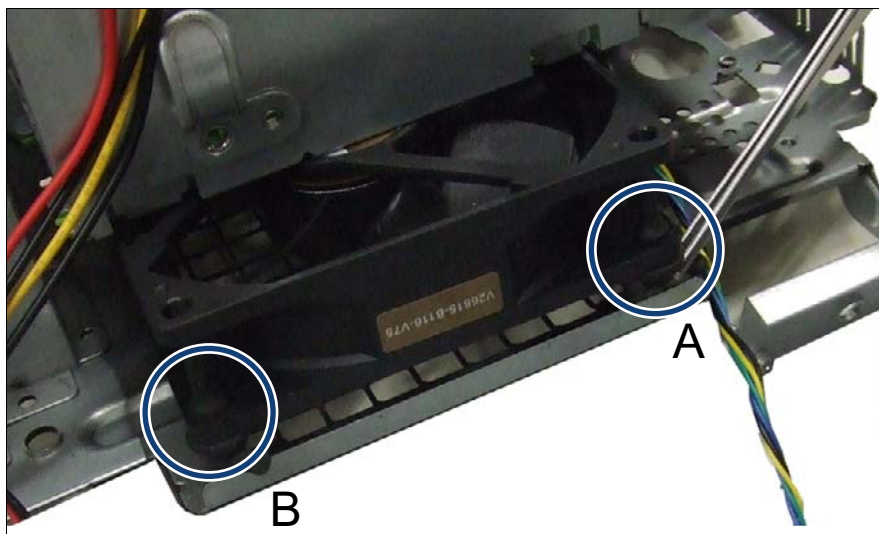
Figure 87: Fitting front fan rivets

► Put the two front fan rivets A and B into the fan slots in the chassis with the help of a pincer (see circles).
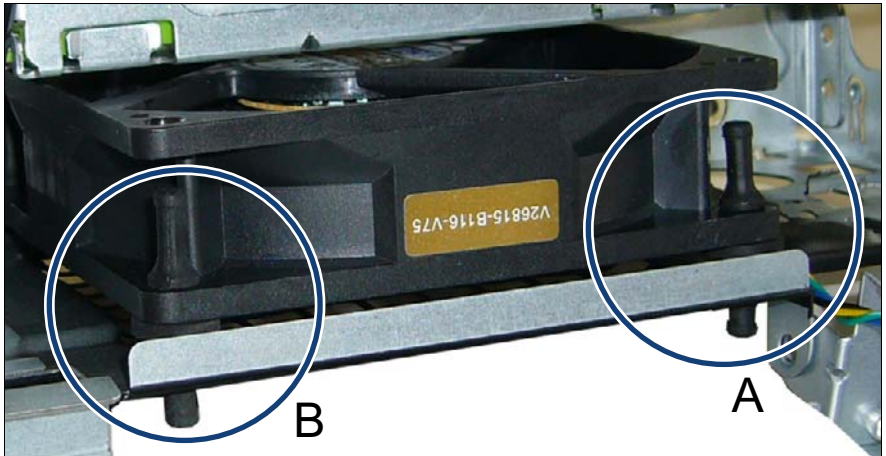
Figure 88: Position of front fan rivets A and B

► Make sure that both front fan rivets A and B fit the holes in the chassis fan slots (see circles).
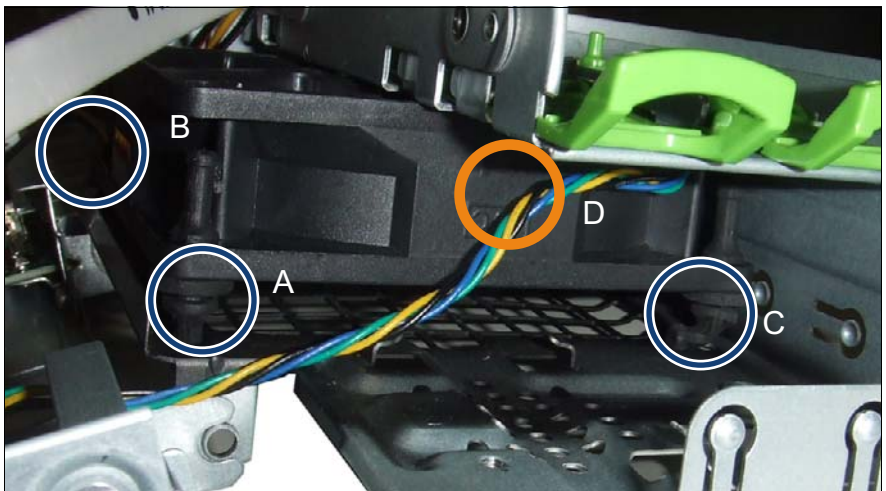
Figure 89: Position of all front fan rivets

► The two front fan rivets C and D also must fit the holes in the chassis fan slots (see circles).

> **i** Note that front fan rivet D is hidden (see orange circle).

Figure 90: Fitting front fan rivet C

▶ Use a pincer to fit front fan rivet C in the hole in the chassis fan slot (see circle).
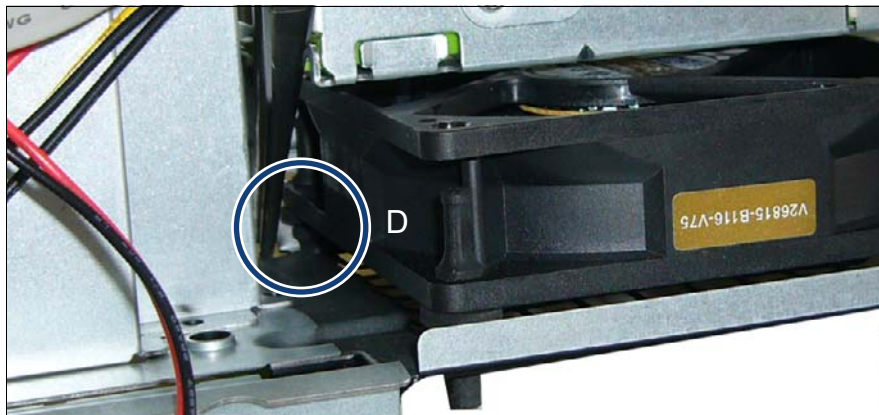
Figure 91: Fitting front fan rivet D

▶ Use a pincer to fit front fan rivet D in the hole in the chassis fan slot (see circle).
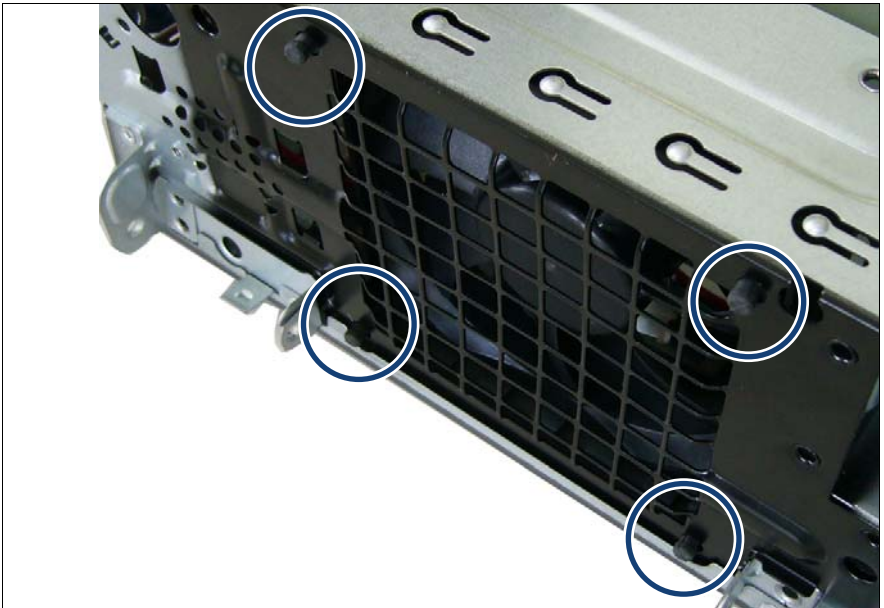
Figure 92: Position of the front fan rivets in the chassis fan slots

► Make sure that all front fan rivets match the holes in the chassis fan slots (see circles).

Figure 93: Initial position of a front fan rivet in the chassis fan slot

First, the front fan rivets are sticking out of the chassis fan slots marginally.

Figure 94: Final position of a front fan rivet in the chassis fan slot

► Tear out the front fan rivets a little bit.
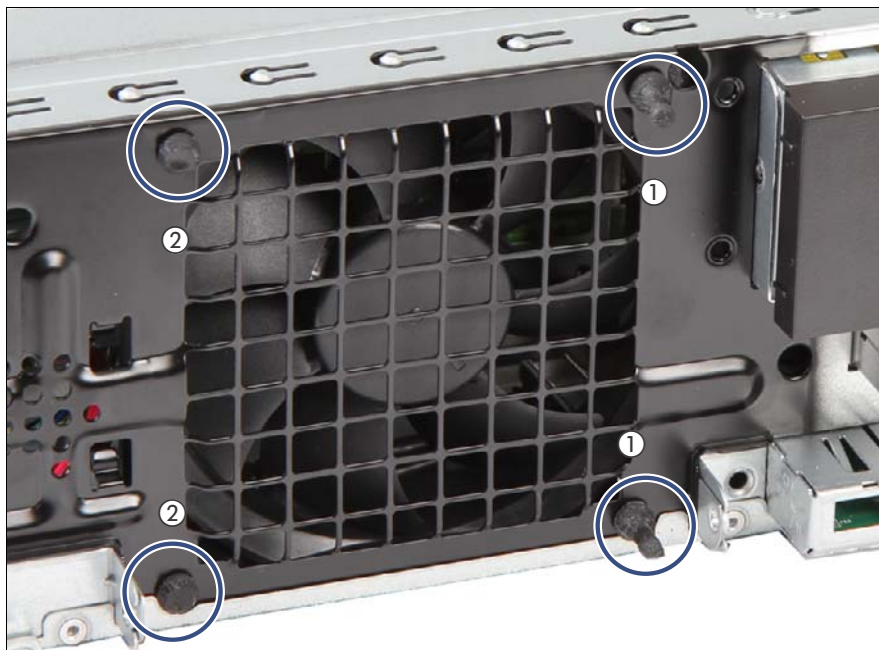
Figure 95: Cutting the overlaying part of the front fan rivets

► Cut the overlaying part of the front fan rivets (1) with the side cutter (2).

► Install the fan cable.
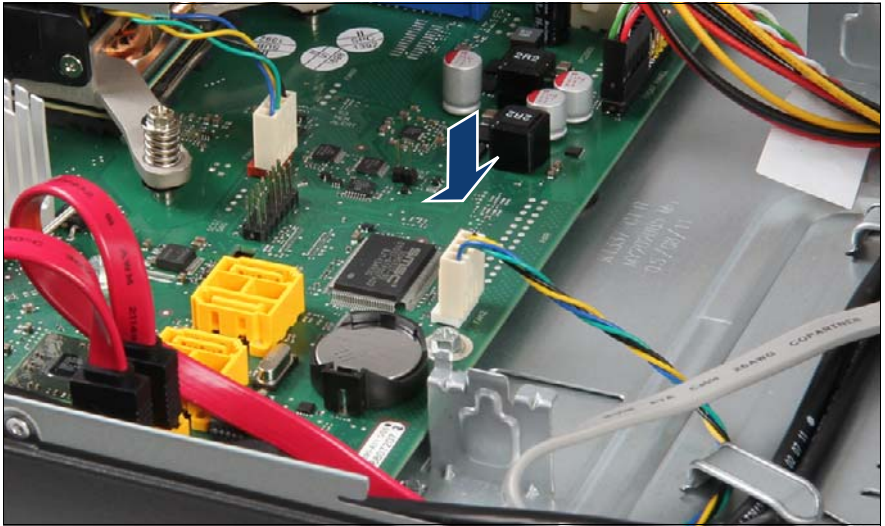
Figure 96: Connecting the system fan cable

► Connect the fan cable to system board connector FAN2.

8.1.5 Concluding steps

► Follow all procedures described in section "Closing the server" on page 54.

9 Expansion cards

This chapter provides information on how to install, remove or replace expansion cards.

Safety notes

⚠ **CAUTION!**

- Do not damage or modify internal cables or devices. Doing so may cause a device failure, fire, or electric shock.

- Devices and components inside the server remain hot after shutdown. After shutting down the server, wait for hot components to cool down before installing or removing internal options.

- Circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. Always discharge static build-up (e.g. by touching a grounded object) before handling electrostatic-sensitive devices (ESDs).

- Do not touch the circuitry on boards or soldered parts. Hold circuit boards by their metallic areas or edges.

- If devices are installed or disassembled using methods other than those outlined in this chapter, the warranty will be invalidated.

- For further information, please refer to chapter "Important information" on page 31.

In this chapter

- "Installing expansion cards" on page 161

- "Removing expansion cards" on page 165

- "Mounting expansion card slot brackets" on page 173

9.1   Basic procedure

The system board is equipped with four expansion slots:
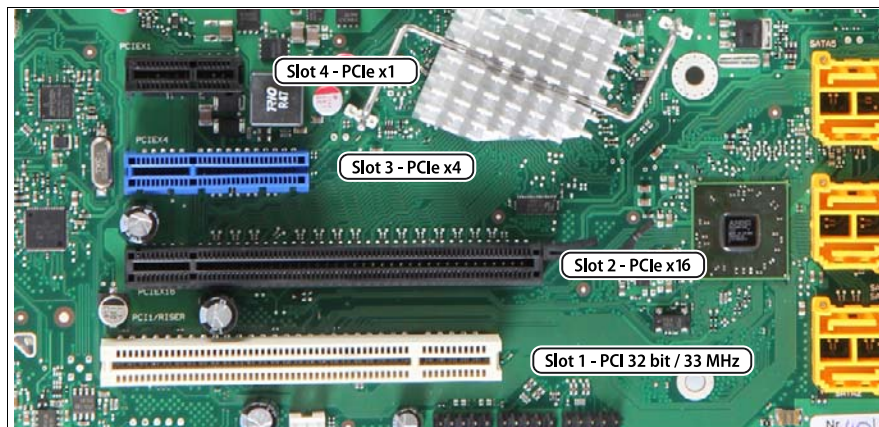
Figure 97: PCI slot overview

PCI slot	Type	Function
1	PCI 32 bit / 33 MHz	
2	PCIe x16	(mechanical width: x16)
3	PCIe x4	(mechanical width: x4)
4	PCIe x1	(mechanical width: x1)

Slot sequence

Expansion Card			Slot number / bus type		
Type	**Vendor**	**Model**	**Slot 2 PCIe x16**	**Slot 3 PCIe x4**	**Slot 4 PCIe x1**
SATA	Onboard	AMD 880G Chipset	-	-	-
Ethernet	Onboard Broadcom	Broadcom BCM 57780	-	-	-
	Broadcom	Dash LAN D2907	-	-	o
	Intel	Quad Port FJ D2745 Server Adapter	-	o	-

Table 4: Expansion card slot sequence

9.2 Expansion cards

9.2.1 Installing expansion cards

Upgrade and Repair Units (URU)

Average hardware task duration: 5 minutes

Average software task duration: 5 minutes

9.2.1.1 Required tools

● Preliminary and concluding steps: tool-less

● Installing expansion cards: tool-less

9.2.1.2 Preliminary steps

Before installing an expansion card, perform the following steps:

▶ Disable BitLocker functionality as described in section "Disabling BitLocker functionality" on page 59.

▶ Follow all procedures described in section "Opening the server" on page 48.

9.2.1.3   Removing a PCI slot bracket
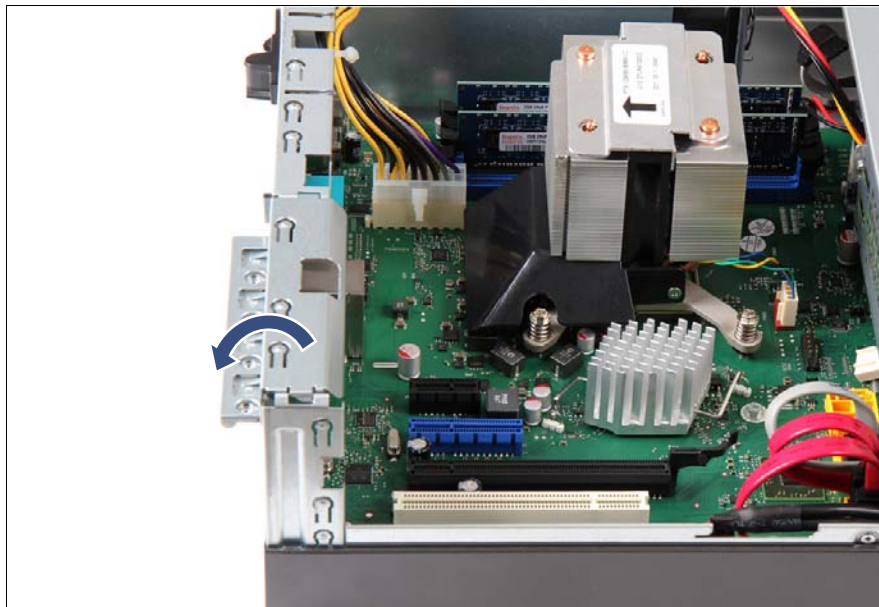
Figure 98: Opening the PCI slot bracket clamp

► Fold up the slot bracket clamp.
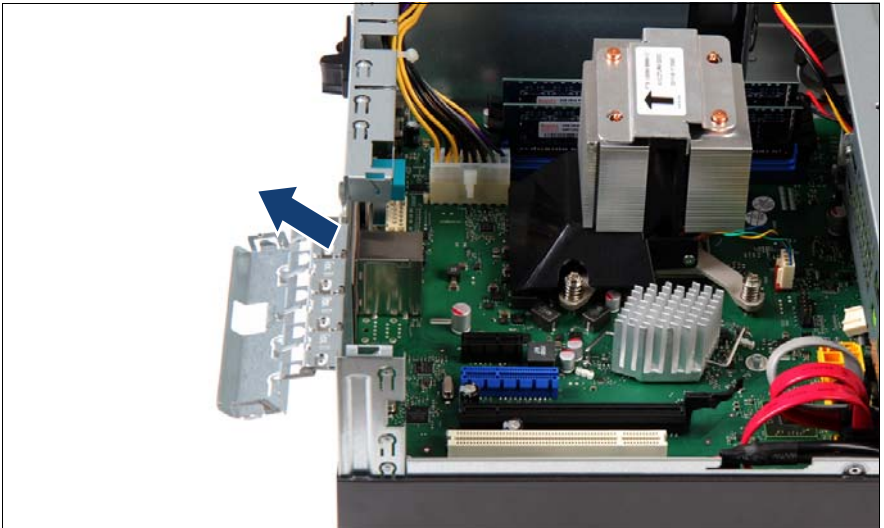
Figure 99: Removing the PCI slot bracket

► Remove the slot bracket.

⚠ **CAUTION!**

Keep the slot bracket for further use.

Always replace slot brackets into unused PCI slot openings to comply with applicable EMC regulations and satisfy cooling requirements.

9.2.1.4   Installing an expansion card

► Remove the expansion card from its protective packaging.

ℹ For further instructions regarding controller settings, please refer to the accompanying documentation.

► If applicable, attach the required slot bracket to the expansion card as described in section "Mounting expansion card slot brackets" on page 173.
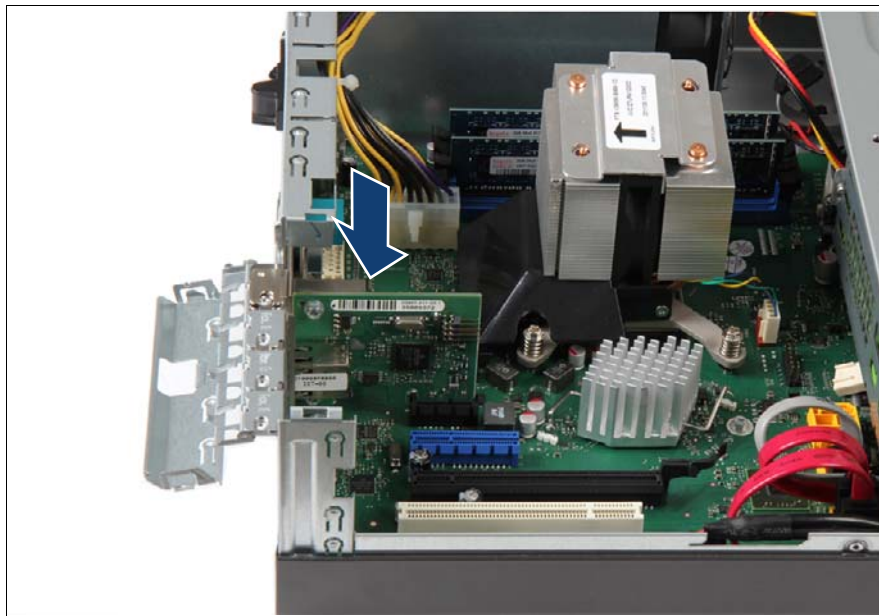
Figure 100: Installing the expansion card

► Carefully insert the expansion card into the desired PCI slot and press down firmly until it is fully seated in the slot.

► Fold down slot bracket clamp until it locks in place.

9.2.1.5   Connecting cables to the expansion card

► If applicable, connect internal cables to the expansion card.

> **i** For a complete cabling overview, please refer to section "Cabling" on page 235.

9.2.1.6   Concluding steps

Perform the following procedures to complete the task:

► Follow all procedures described in section "Closing the server" on page 54.

► After installing or replacing a Modular RAID controller, update the firmware as described in section "Updating RAID controller firmware" on page 63.

► In order to configure an expansion card that has been installed or replaced, the card's Option ROM has to be enabled in the system board BIOS. If applicable, proceed as described in section "Enabling Option ROM scan" on page 64.

► If the new expansion card replaces a previously installed network adapter, inform the customer about changed MAC addresses. For further information, refer to section "Looking up changed MAC addresses" on page 67.

► If BitLocker functionality is used and has been disabled before starting the maintenance task, re-enable BitLocker as described in section "Enabling BitLocker functionality" on page 66.

9.2.2   Removing expansion cards

Upgrade and Repair Units (URU)

Average task duration: 5 minutes

9.2.2.1   Required tools

● Preliminary and concluding steps: tool-less

● Removing expansion cards: tool-less

9.2.2.2   Preliminary steps

Before removing an expansion card, perform the following steps:

► Disable BitLocker functionality as described in section "Disabling BitLocker functionality" on page 59.

► Follow all procedures described in section "Opening the server" on page 48.

9.2.2.3   Removing an expansion card
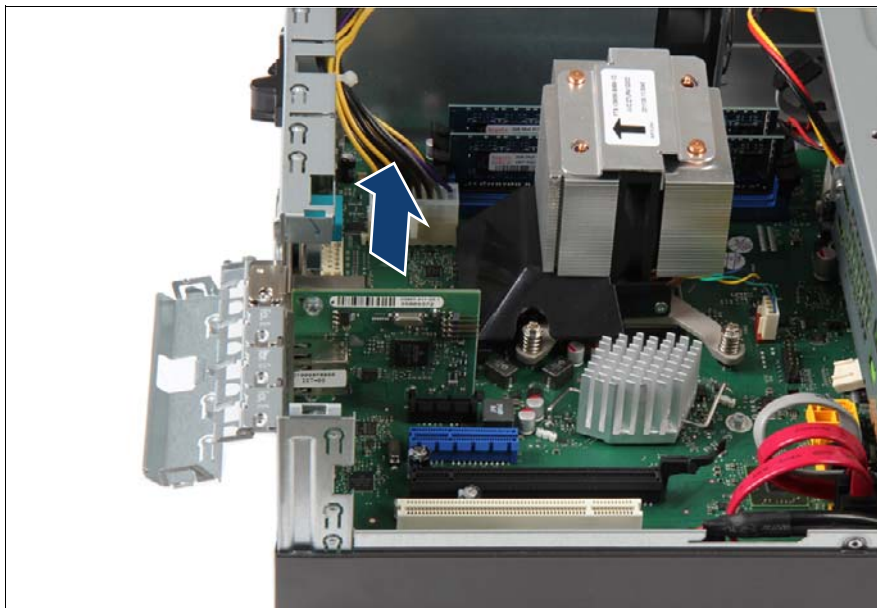
Figure 101: Removing an expansion card

► If necessary, disconnect all cables from the expansion card.

► Fold up the locking handle on the slot bracket clamp.

► Carefully remove the expansion card from its slot.

9.2.2.4   Installing a PCI slot bracket

⚠️ **CAUTION!**

Always replace slot brackets into unused PCI slot openings to comply with applicable EMC regulations and satisfy cooling requirements.
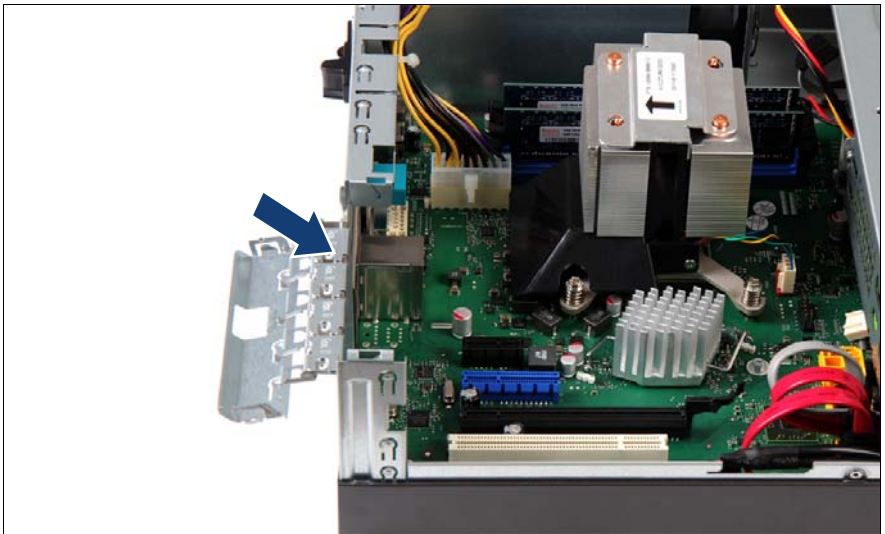
Figure 102: Installing a PCI slot bracket

► Insert a PCI slot bracket into the unused PCI slot opening.

► Fold down slot bracket clamp until it locks in place.

9.2.2.5   Concluding steps

Perform the following procedures to complete the task:

► Follow all procedures described in section "Closing the server" on page 54.

► If BitLocker functionality is used and has been disabled before starting the maintenance task, re-enable BitLocker as described in section "Enabling BitLocker functionality" on page 66.

9.2.3   Installing eSATA cable

🔧 **Upgrade and Repair Units (URU)**

🕐 **Average hardware task duration: 5 minutes**

9.2.3.1   Required tools

● Preliminary and concluding steps: tool-less

● Installing expansion cards: tool-less

9.2.3.2   Preliminary steps

Before installing an expansion cable, perform the following steps:

► Follow all procedures described in section "Opening the server" on page 48.

► Remove a PCI slot bracket as described in section "Removing a PCI slot bracket" on page 162.

9.2.3.3   Installing an eSATA cable (optional for specific markets)

► Remove the eSATA cable from its protective packaging.

> **i** For further instructions regarding controller settings, please refer to the "Description - BIOS Manual D3090 / D3091".
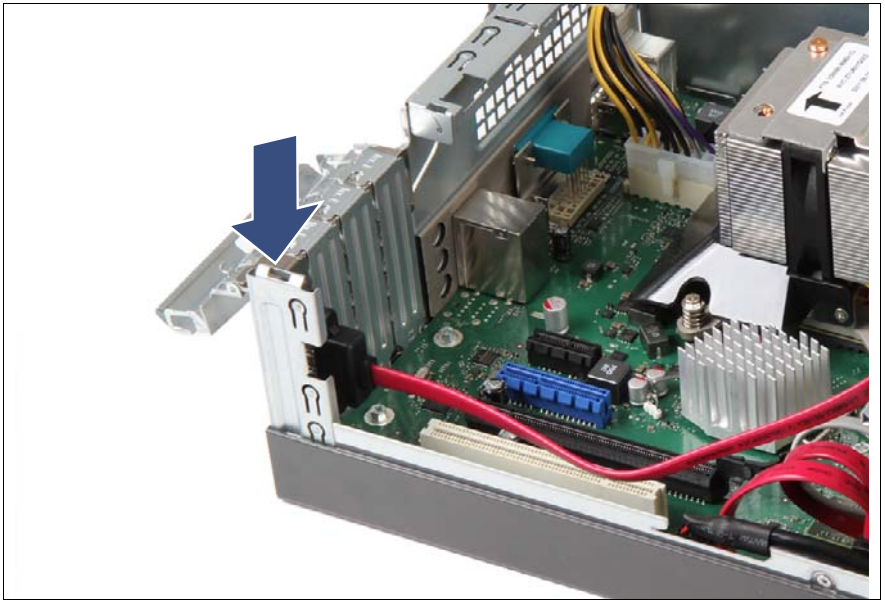
Figure 103: Installing the eSATA cable

▶ Carefully insert the eSATA cable into the desired PCI slot and press down firmly until it is fully seated in the slot.

▶ Fold down slot bracket clamp until it locks in place.

9.2.3.4 Connecting cable of the eSATA cable to connector

Figure 104: Connecting the eSATA cable

► Connect the end of eSATA cable to the system board connector SATA6.

► Fold the cable carefully as shown in the picture.

9.2.3.5 Concluding steps

Perform the following procedures to complete the task:

► Follow all procedures described in section "Closing the server" on page 54.

9.2.4 Removing eSATA cable

Upgrade and Repair Units (URU)

Average task duration: 5 minutes

9.2.4.1 Required tools

- Preliminary and concluding steps: tool-less

- Removing expansion cards: tool-less

9.2.4.2 Preliminary steps

Before removing an eSATA cable, perform the following steps:

► Follow all procedures described in section "Opening the server" on page 48.

9.2.4.3 Disconnecting eSATA cable (optional for specific markets)

Figure 105: Disconnecting the eSATA cable

► Disconnect the end of eSATA cable from the system board connector SATA6.

9.2.4.4   Removing an eSATA cable
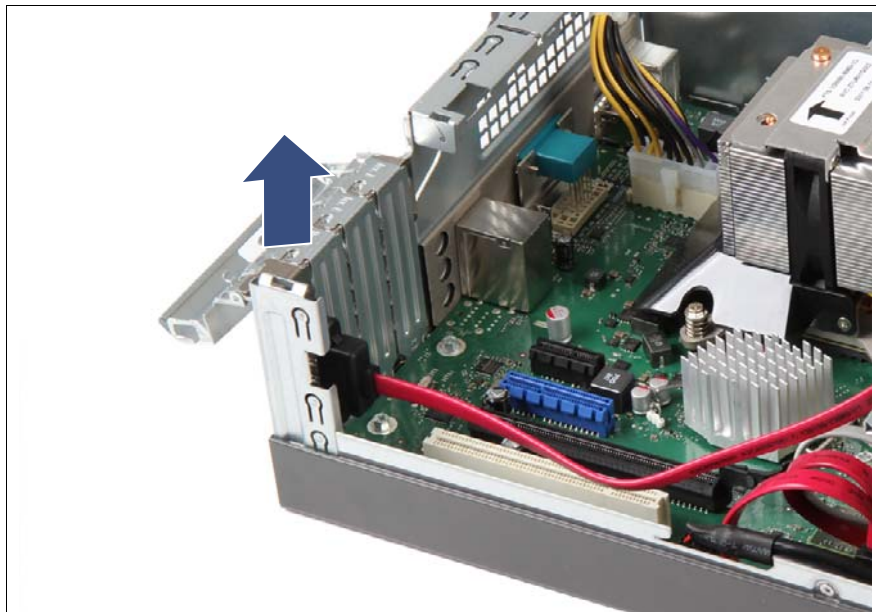
Figure 106: Removing an eSATA cable

► Fold up the locking handle on the slot bracket clamp.

► Carefully remove the eSATA cable from its slot.

9.2.4.5   Concluding steps

Perform the following procedures to complete the task:

► Install a PCI slot bracket as described in section "Installing a PCI slot bracket" on page 167.

► Follow all procedures described in section "Closing the server" on page 54.

9.3 Additional tasks

This section provides additional expansion card related information on how to install slot brackets.

9.3.1 Mounting expansion card slot brackets

Customer Replaceable Units (CRU)

Average task duration: 5 minutes

This section provides general instructions on mounting slot brackets as well as specific instructions for the following network adapters:

● "Network adapter D2907" on page 174

● "Network adapter D2745" on page 176

9.3.1.1 Required tools

● Preliminary and concluding steps: tool-less

● Mounting slot brackets:

   – Phillips PH2 / (+) No. 2 screw driver

9.3.1.2   Network adapter D2907
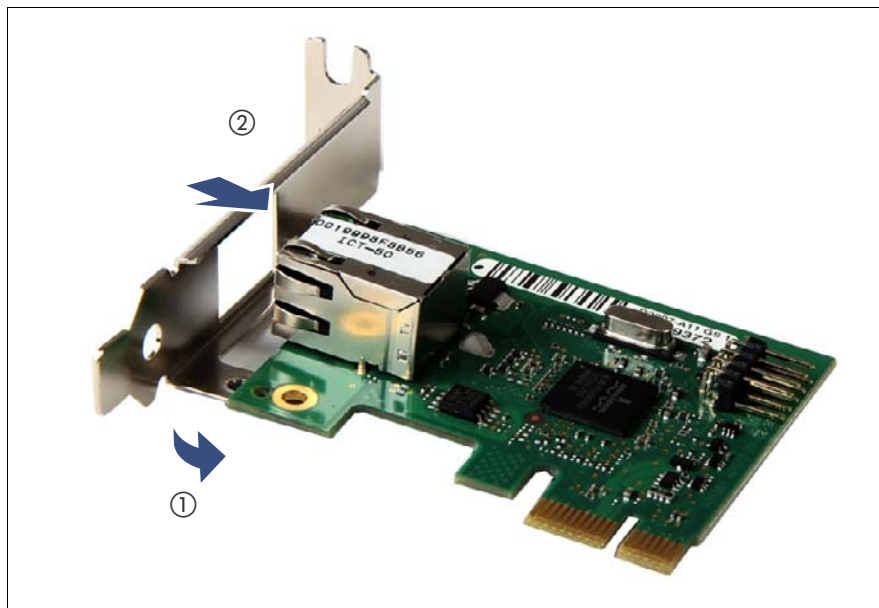
Figure 107: Network adapter D2907 - Mounting the slot bracket (A)

► Place the controller on the mounting tabs on the slot bracket (1).

► Carefully shift the slot bracket towards the controller (2) until the plug shells engage with the cut-outs in the slot bracket connector panel.
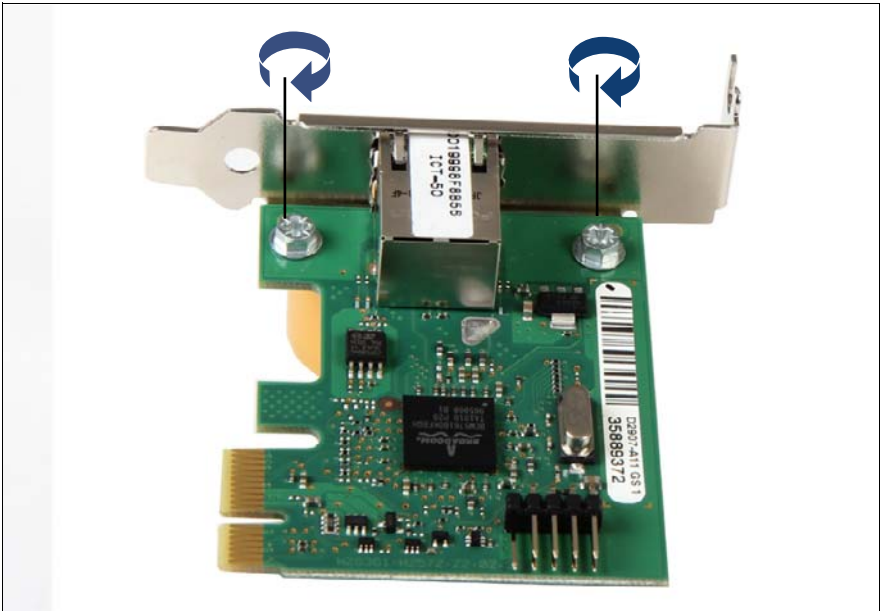
Figure 108: Network adapter D2907 - Mounting the slot bracket (B)

▶ Secure the slot bracket to the controller with two M3 x 4.5 mm screws.
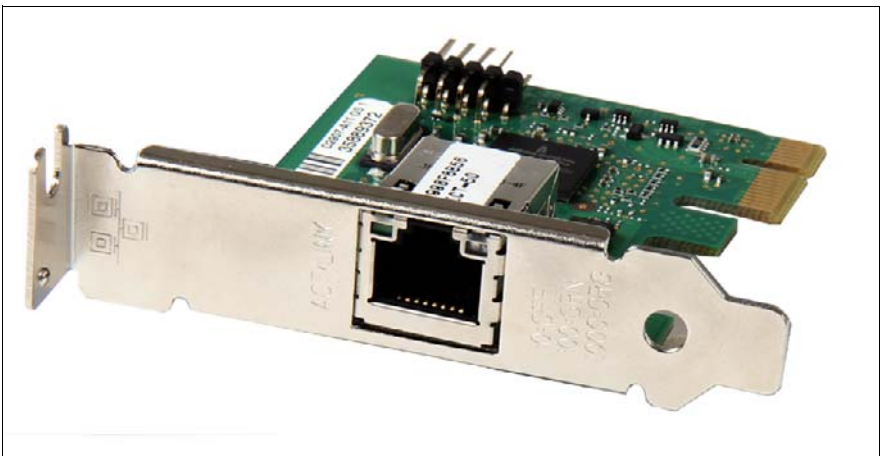
Figure 109: Network adapter D2907 - Mounting the slot bracket (C)

i	Assembled network adapter D2907.

9.3.1.3   Network adapter D2745
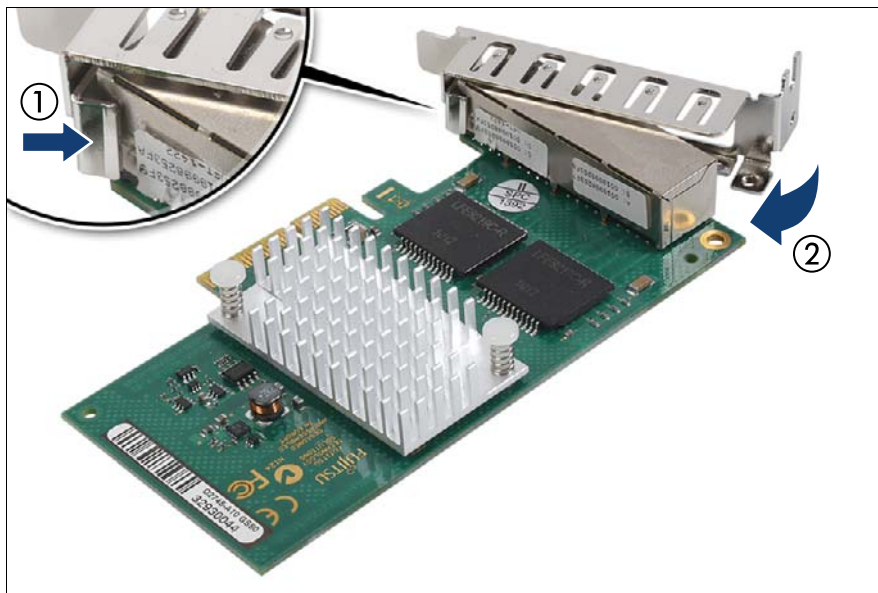
Figure 110: Network adapter D2745 - Mounting the slot bracket (A)

► Hinge the slot bracket to the plug shell as shown (1).

► Fold the slot bracket towards the controller until the threaded mounting tab is aligned with the screw hole on the controller (2).
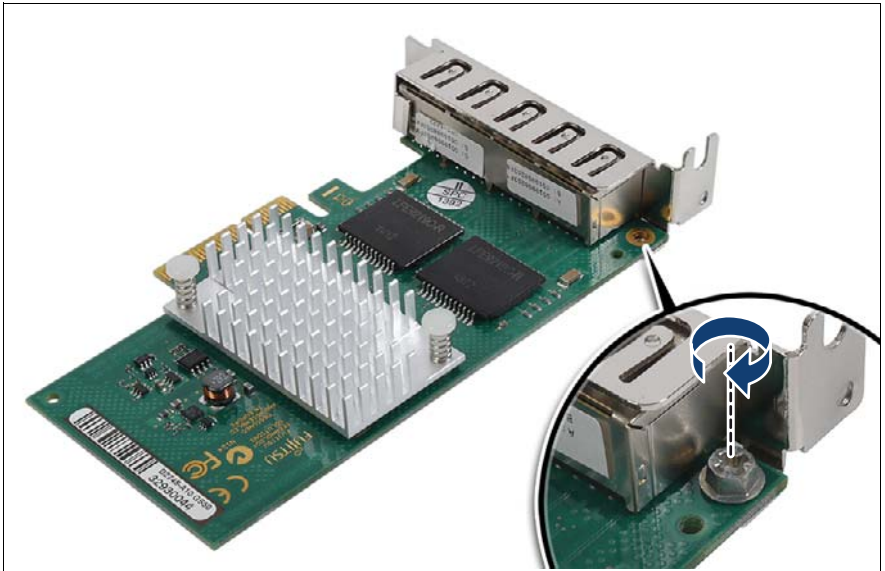
Figure 111: Network adapter D2745 - Mounting the slot bracket (B)

► Secure the slot bracket to the controller with one M3 x 4.5 mm screw.

Figure 112: Network adapter D2745 - Mounting the slot bracket (C)

| i | Assembled network adapter D2745 |

10 Main memory

Safety notes

⚠ **CAUTION!**

- Do not install unsupported third party memory modules. For further information on supported memory modules, refer to section "Basic procedure" on page 180.

- Memory modules remain hot after shutdown. Wait for components to cool down before installing or removing memory modules to prevent burns.

- Do not insert and remove memory modules repeatedly. Doing so may cause failures.

- Pressing out the securing clips on the memory module connector will eject the installed memory module. To prevent damage and injuries eject memory modules carefully without applying excessive force.

- For further information, please refer to chapter "Important information" on page 31.

In this chapter

- "Memory sequence" on page 180
- "Operation modes" on page 181
- "Installing memory modules" on page 182
- "Removing memory modules" on page 184

10.1 Basic procedure

– The system board is equipped with four memory connectors.

– The system has to be equipped with at least one memory module. Populate memory slot 1 first.

– Supported memory modules:
DDR3-1066 PC3-8500, DDR3-1333 PC3-10600 or DDR3-1600 PC3-12800U unbuffered single rank (SR) or dual rank (DR) UDIMM memory modules with or without ECC

– Supported capacities: 1 GB, 2 GB or 4 GB

– Maximum amount of RAM: 16 GB

10.1.1 Memory sequence

– Populate memory slot 1 first.

– Within both channels, memory slot 1 must be populated prior to slot 2.

– If memory modules with different capacities are used:

  – Install modules with higher capacities first.
  – Within a channel, install modules in descending order of capacity.

– If memory modules with different speeds are used, the lowest clock rate applies for all DIMMs.
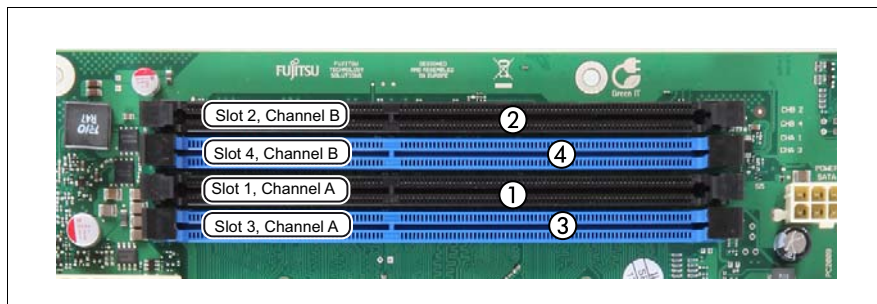
Figure 113: Memory overview

	Number of memory modules inserted			
Slots to be used	**1**	**2**	**3**	**4**
Slot 1, Channel A	o	o	o	o
Slot 2, Channel B		o	o	o
Slot 3, Channel A			o	o
Slot 4, Channel B				o

Table 5: Mounting order

10.1.2 Operation modes

– The maximum performance can be achieved in a symmetric dual-channel configuration. Therefore both channels have to be populated with the same amount of memory. The DRAM device technology (1 Gbit / 2 Gbit / 4 Gbit) may vary from one channel to the other.

– If the amount of memory differs between the two channels, the system board will run in dual-channel asymmetric mode.

– Regardless of the mode, all DIMMs will run at the highest common frequency that is allowed by the SPD Data of the DIMMs and the maximum speed of the selected configuration.

– Single-channel mode is used if one memory module is populated in slot 1.

10.2 Installing memory modules

🔧 **Upgrade and Repair Units (URU)**

🕐 **Average task duration: 5 minutes**

10.2.1 Required tools

● Preliminary and concluding steps: tool-less

● Installing memory modules: tool-less

10.2.2 Preliminary steps

Before installing a memory module, perform the following steps:

► Disable BitLocker functionality as described in section "Disabling BitLocker functionality" on page 59.

► Follow all procedures described in section "Opening the server" on page 48.

10.2.3 Installing a memory module

► Identify the correct memory slot according to the mounting order described in section "Memory sequence" on page 180.

Figure 114: Installing memory modules (A)

► Press out the securing clip at each end of the memory module connector.
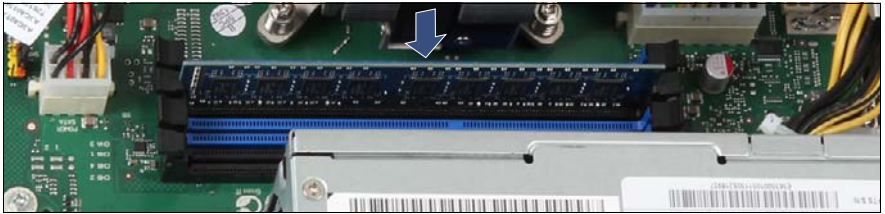
Figure 115: Installing memory modules (B)

► Align the notch on the bottom of the module with the crossbar in the connector.

► Press down on the memory module until the securing clips snap into the cutouts at each end of the module.

10.2.4 Concluding steps

Perform the following procedures to complete the task:

► Follow all procedures described in section "Closing the server" on page 54.

► If available, update the system board BIOS to the latest version as described in section "Updating the system board BIOS" on page 62.

► If BitLocker functionality is used and has been disabled before starting the maintenance task, re-enable BitLocker as described in section "Enabling BitLocker functionality" on page 66.

10.3 Removing memory modules

Upgrade and Repair Units (URU)

Average task duration: 5 minutes

10.3.1 Required tools

- Preliminary and concluding steps: tool-less
- Removing memory modules: tool-less

10.3.2 Preliminary steps

Before removing a memory module, perform the following steps:

► Disable BitLocker functionality as described in section "Disabling BitLocker functionality" on page 59.

► Follow all procedures described in section "Opening the server" on page 48.

10.3.3 Removing a memory module

► Identify the desired memory slot according to the mounting order described in section "Memory sequence" on page 180.

CAUTION!

Ensure to maintain an operational configuration when removing memory modules. For additional information, please refer to section "Operation modes" on page 181.
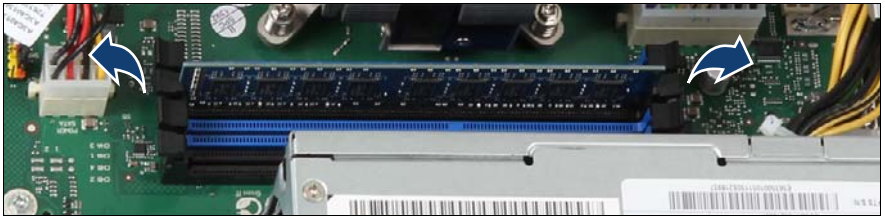
Figure 116: Removing memory modules

▶ Eject the desired memory module by pressing out the securing clips at each end of the memory module connector.

▶ Remove the ejected memory module.

10.3.4 Concluding steps

Perform the following procedures to complete the task:

▶ Follow all procedures described in section "Closing the server" on page 54.

▶ If available, update the system board BIOS to the latest version as described in section "Updating the system board BIOS" on page 62.

▶ If BitLocker functionality is used and has been disabled before starting the maintenance task, re-enable BitLocker as described in section "Enabling BitLocker functionality" on page 66.

11 Processors

Safety notes

⚠ **CAUTION!**

● Do not install unsupported processors. For further information on supported processors, refer to section "Basic procedure" on page 188.

● Circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. Always discharge static build-up (e.g. by touching a grounded object) before handling electrostatic-sensitive devices (ESDs)

● Do not touch the circuitry on boards or soldered parts. Hold circuit boards by their metallic areas or edges.

● When removing or installing the processor, be careful not to touch or bend the processor pins.

● For further information, please refer to chapter "Important information" on page 31.

In this chapter

11.1 Basic procedure

Supported processors

– AMD FX, AMD Sempron, Athlon II, Phenom II

– Socket type: AM3+

– Thermal Design Power (TDP) class: 95W

11.2 Replacing the processor heat sink

 Field Replaceable Units (FRU)

 Average task duration: 15 minutes

11.2.1 Required tools

● Preliminary and concluding steps: tool-less

● Removing and installing the processor heat sink:

– Phillips PH2 / (+) No. 2 screw driver

11.2.2 Preliminary steps

Before replacing the processor heat sink, perform the following steps:

► Follow all procedures described in section .

11.2.3   Removing the processor heat sink

Figure 117: Removing the processor heat sink

▶   Loosen the four captive screws on the heat sink in a crossover pattern.

▶   Disconnect the CPU fan cable from the system board connector FAN1.

▶   Carefully turn the heat sink back and forth to detach it from the processor.

> **i**   This may be necessary due to the adhesive quality of the thermal paste located between the heat sink and processor.

▶   Lift the heat sink out of the chassis.

▶   Thoroughly clean residual thermal paste from the surface of the heat sink and the processor using a lint-free cloth.

11.2.4 Thermal paste

i	On a new CPU heat sink a thin layer of thermal compound has already been pre-applied to its lower surface. This layer of thermal compound is protected by a cover.

▶ Remove the cover at the lower surface of the new heat sink.

11.2.5 Installing the processor heat sink
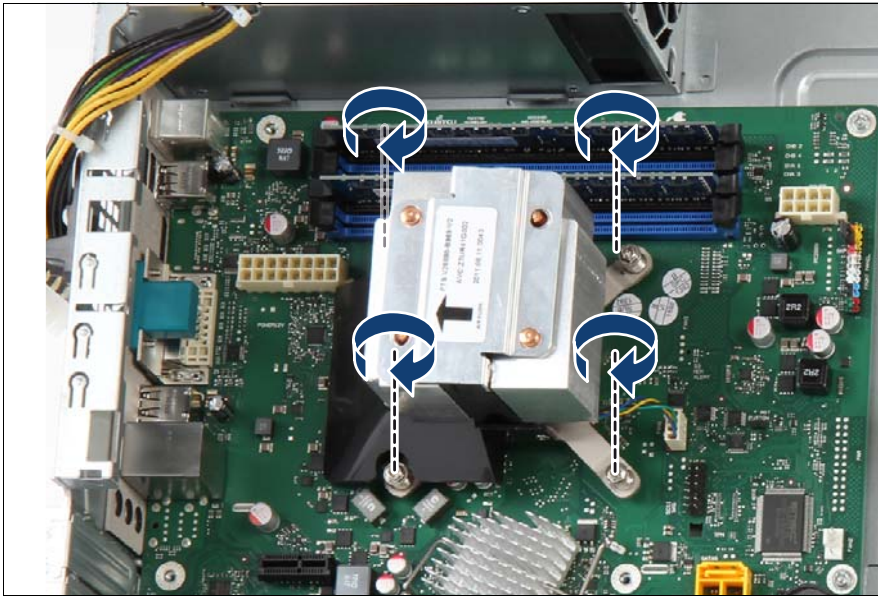
Figure 118: Installing the heat sink

▶ Carefully seat the heat sink on the four threaded holes as shown.

⚠ **CAUTION!**

– The printed arrow on the heat sink must point to the rear side of the chassis.

– Ensure that the screws on the heat sink are properly seated on the threaded holes.

– Ensure that the heat sink cooling fins match the direction of the airflow!

▶ Fasten the four captive screws on the heat sink (screw torque: 0.6 Nm, not applicable for the Japanese market).

▶ Connect the CPU fan cable to the system board connector FAN1.

11.2.6 Concluding steps

Perform the following procedures to complete the task:

▶ Follow all procedures described in section "Closing the server" on page 54.

11.3 Replacing the processor

Field Replaceable Units (FRU)

Average hardware task duration: 15 minutes

Average software task duration: 5 minutes

CAUTION!
Processors are extremely sensitive to electrostatic discharge and must be handled with care. After a processor has been removed from its protective sleeve or from its socket, place it upside down on a nonconducting, antistatic surface. Never push a processor over a surface.

11.3.1 Required tools

● Preliminary and concluding steps: tool-less

● Removing and installing the processor heat sink:

– Phillips PH2 / (+) No. 2 screw driver

● Removing and installing the processor: tool-less

11.3.2 Preliminary steps

Before upgrading or replacing the processor, perform the following steps:

► Disable BitLocker functionality as described in section "Disabling BitLocker functionality" on page 59.

► Follow all procedures described in section "Opening the server" on page 48.

11.3.3 Removing the processor heat sink

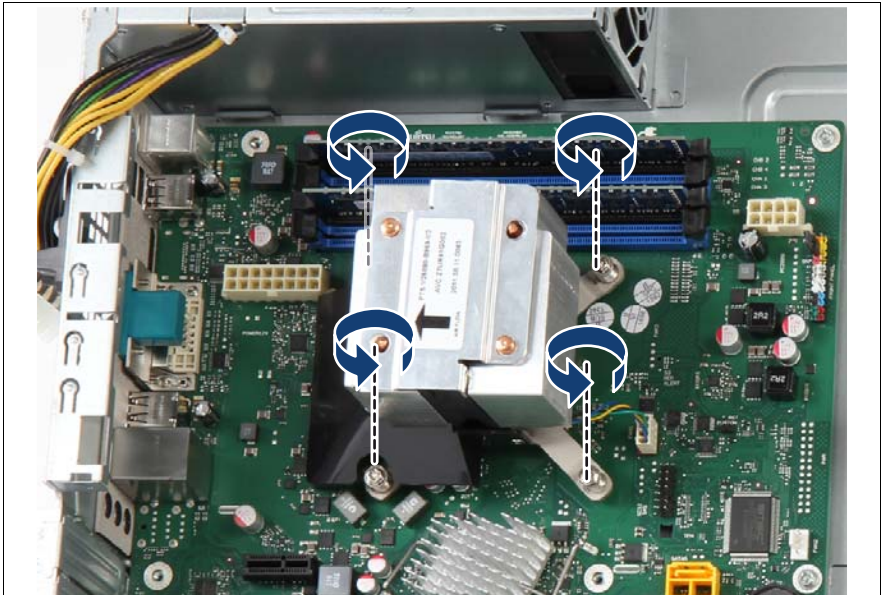Refer to section "Removing the processor heat sink" on page 189 for removing the processor heat sink.

11.3.4 Removing the processor
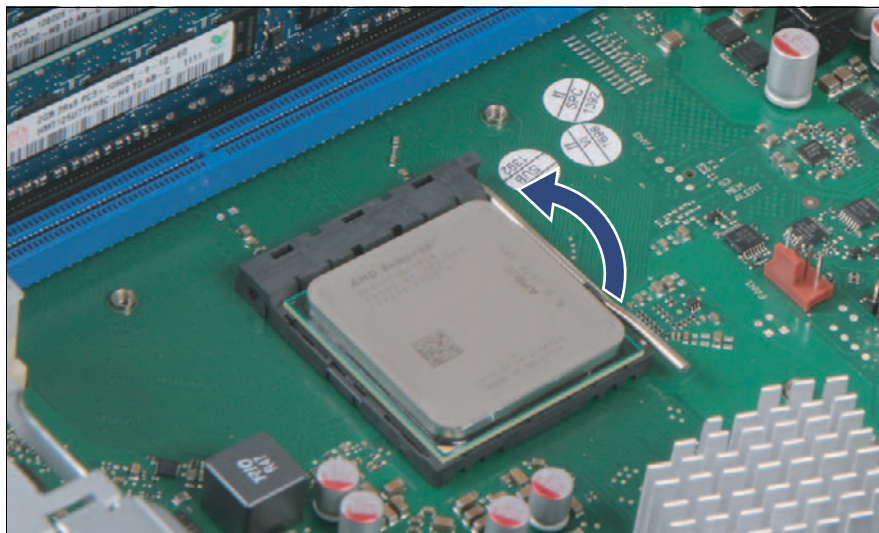
Figure 119: Unlatching the socket lever

► Unlatch the socket lever by pushing it slightly away from the socket.

► Fold back the socket release lever.
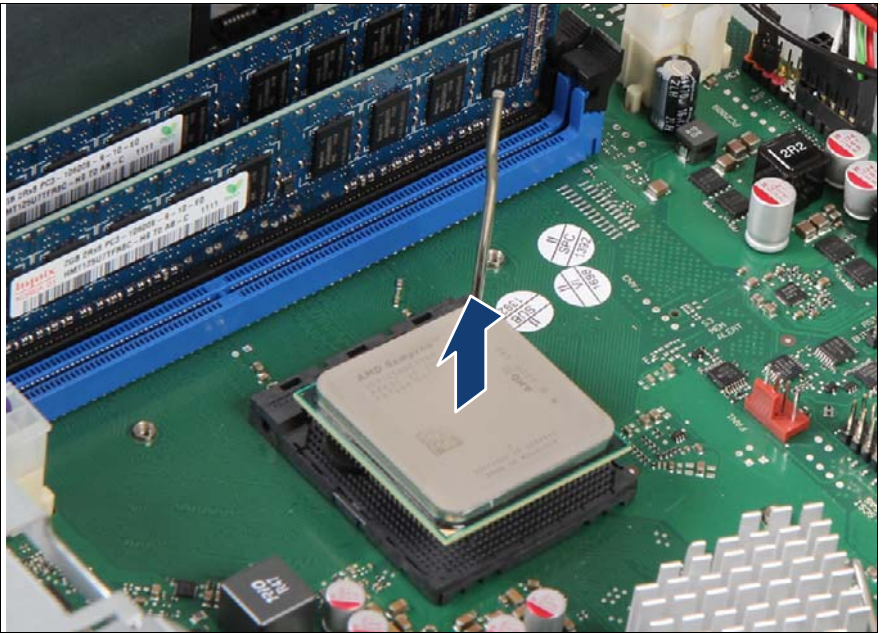
Figure 120: Removing the processor

► Carefully remove the defective processor from its socket in a vertical motion.

11.3.5   Installing the processor
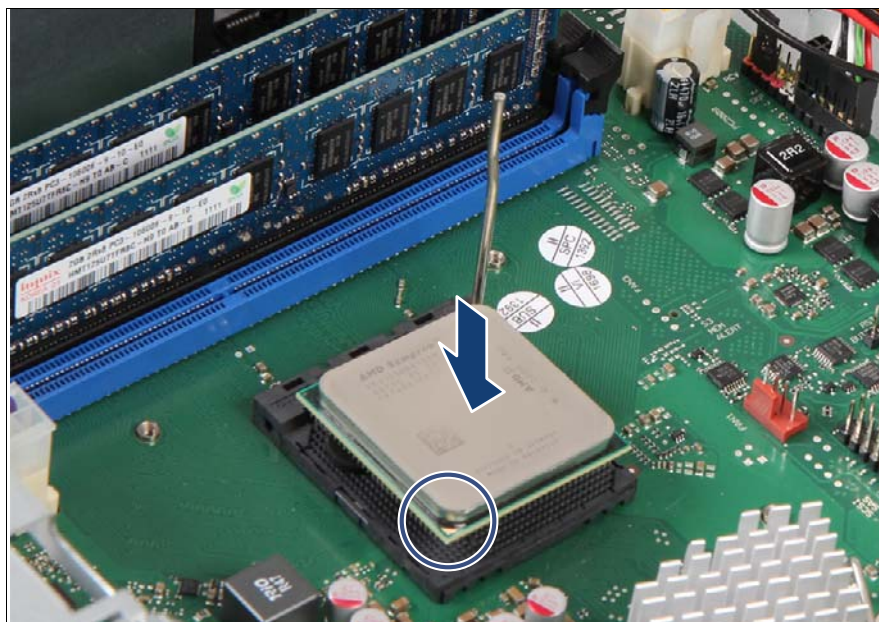
Figure 121: Installing the processor

► Hold the processor with your thumb and index finger. Make sure that the indication triangle on the processor aligns with the notch on the socket.

► Lower the processor straight down without tilting or sliding it in the socket.

CAUTION!

– Ensure that the processor is level in the socket.

– Be careful not to touch or bend the pins on the processor.

– Never touch the underside of the processor. Even minor soiling such as grease from the skin can impair the processor's operation or destroy the processor.

– Ensure not to scrape or dent the processor edges.

Figure 122: Latching the socket lever

► Latch the socket lever.

11.3.6 Applying thermal paste

| i | For the Japanese market, follow the instructions provided separately. |

| i | If the processor upgrade or replacement kit contains a new CPU heat sink, a thin layer of thermal compound has already been pre-applied to its lower surface. This layer of thermal compound is protected by a cover.In this case, please proceed with section "Installing the processor heat sink" on page 197. |
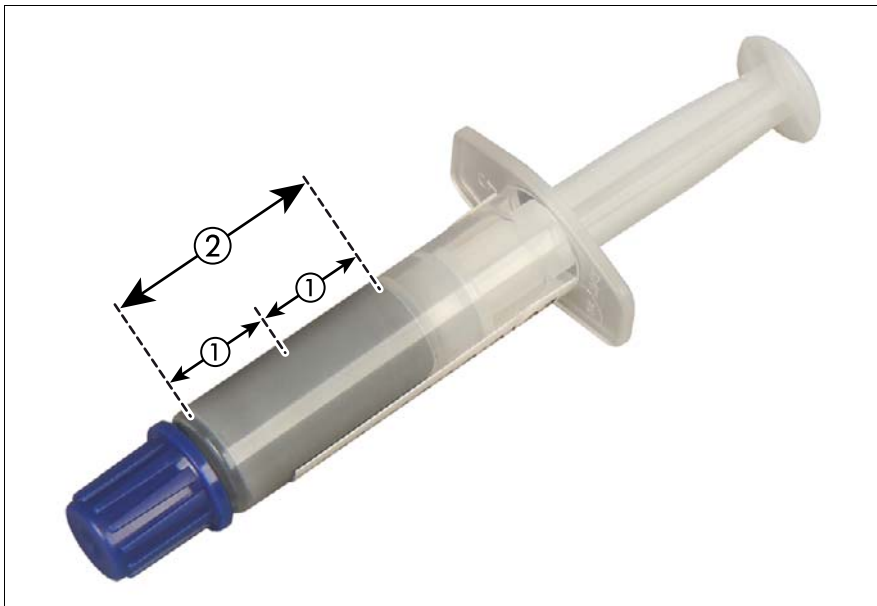
Figure 123: Thermal paste syringe

One thermal compound syringe (FSP:P304000003) contains thermal paste for two processors.

In order to determine the correct amount of thermal paste (equal to 1.0 gram), divide the grey area of the syringe up into two equal segments.

| i | Add graduation marks to the syringe using a permanent marker to help you apply the thermal paste. |

Figure 124: Applying thermal paste

► Apply a small streak of thermal paste (1.0 gram, see description above) to the center of the processor surface as shown.

⚠ **CAUTION!**

Do not mix different types of thermal paste.

11.3.7 Installing the processor heat sink

Refer to section "Installing the processor heat sink" on page 190 for installing the processor heat sink.

11.3.8 Concluding steps

Perform the following procedures to complete the task:

► Follow all procedures described in section "Closing the server" on page 54.

► If available, update the system board BIOS to the latest version as described in section "Updating the system board BIOS" on page 62.

► If BitLocker functionality is used and has been disabled before starting the maintenance task, re-enable BitLocker as described in section "Enabling BitLocker functionality" on page 66.

Processors

12 System board and components

This chapter provides information on how to replace the system board and system board components as its CMOS battery and the Trusted Platform Module (TPM).

Safety notes

⚠ **CAUTION!**

- Devices and components inside the server remain hot after shutdown. After shutting down the server, wait for hot components to cool down before installing or removing internal options.

- Circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. Always discharge static build-up (e.g. by touching a grounded object) before handling electrostatic-sensitive devices (ESDs).

- Do not touch the circuitry on boards or soldered parts. Hold circuit boards by their metallic areas or edges.

- For further information, please refer to chapter "Important information" on page 31.

In this chapter

- "Removing the CMOS battery" on page 201

- "Installing the CMOS battery" on page 202

- "Installing the TPM board" on page 204

- "Removing the TPM board" on page 209

- "Replacing the system board" on page 213

12.1 Replacing the CMOS battery

🔧 **Upgrade and Repair Units (URU)**

🕐 **Average task duration: 5 minutes**

CMOS memory (volatile BIOS memory) and the real-time clock are powered by a lithium coin cell (CMOS battery). This cell lasts two to ten years, depending on ambient temperature and use.

If the CMOS battery is depleted or falls below minimum voltage levels, it need to be replaced immediately.

Safety notes

⚠️ **CAUTION!**

● The CMOS battery must be replaced with an identical battery or with a battery type recommended by the manufacturer.

● Keep lithium batteries away from children.

● Do not throw batteries into the trash can. Lithium batteries must be disposed of in accordance with local regulations concerning special waste.

● For further safety information, please refer to section "Environmental protection" in the PRIMERGY MX130 S2 Operating Manual.

● **Ensure to insert the CMOS battery the with the positive pole facing up!**

12.1.1 Required tools

● Preliminary and concluding steps: tool-less

● Replacing the battery: tool-less; recommended: tooth pick

12.1.2 Preliminary steps

Before replacing the CMOS battery, perform the following steps:

► Follow all procedures described in section "Opening the server" on page 48.

12.1.3 Removing the CMOS battery

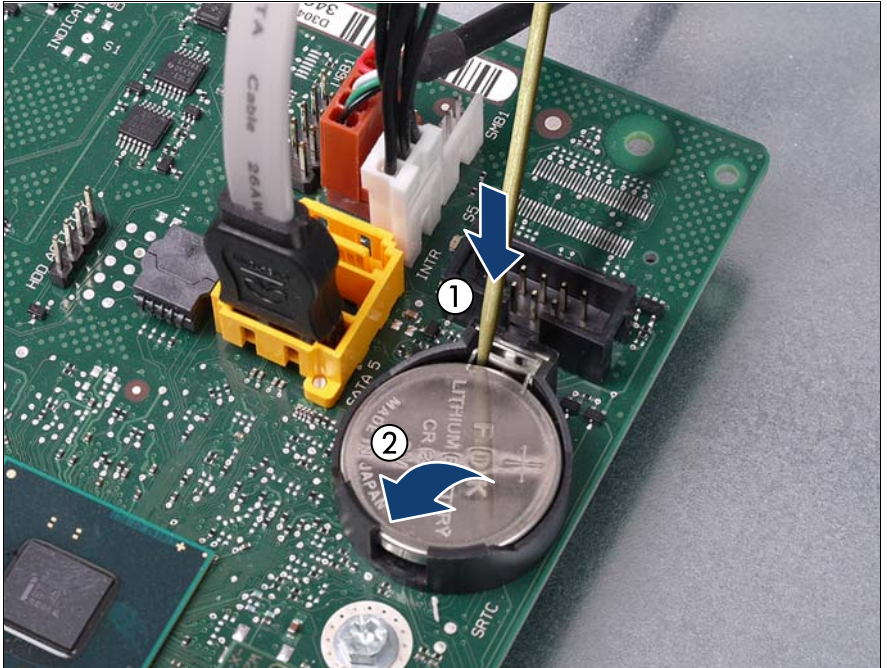Figure 125: Removing the CMOS battery

► Press out on the locking spring to eject the depleted CMOS battery (1).

► If the CMOS battery cannot be ejected this way, use a toothpick (recommended) or similar tool as a lever: Insert the toothpick between the battery and locking spring as shown.

⚠ **CAUTION!**

Do not use sharp-edged tools like screw drivers as they may damage system board components when slipping.

► Carefully pry the depleted CMOS battery out of its socket.

► Remove the CMOS battery (2).

> **i** Do not throw the CMOS battery into the trash can. Lithium batteries must be disposed of in accordance with local regulations concerning special waste.
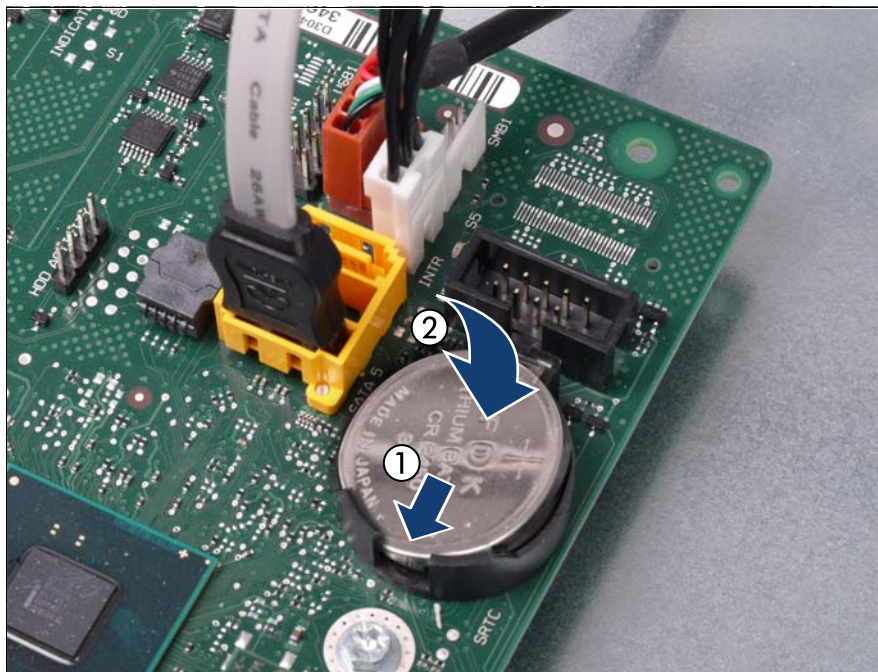
12.1.4 Installing the CMOS battery

Figure 126: Installing the CMOS battery

► At a slight angle, fit the new CMOS battery into its socket as shown (1).

> ⚠ **CAUTION!**
>
> Ensure to insert the CMOS battery with the positive pole (label side) facing up.
>
> The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer (CR2032).

This information does not apply to the Japanese market.

Do not throw lithium batteries into the trash can. They must be disposed of in accordance with local regulations concerning special waste.

Make sure that you insert the battery the right way round. The plus pole must be on the top!

► Push down the CMOS battery (2) until it locks in place.

► Ensure that the locking spring is properly engaged.

12.1.5 Concluding steps

Perform the following procedures to complete the task:

► Dispose of the CMOS battery in accordance with local regulations concerning special waste.

► Follow all procedures described in section "Closing the server" on page 54.

12.2 Trusted Platform Module (TPM)

This section provides information on how to install, remove or replace the Trusted Platform Module (TPM).

12.2.1 Installing the TPM board

Field Replaceable Units (FRU)

Average hardware task duration: 5 minutes

12.2.1.1 Required tools

● Preliminary and concluding steps:

– Phillips PH2 / (+) No. 2 screw driver

● Installing the TPM:

– Bit screw driver
– TPM bit insert *

*For the Japanese market:

– TPM module fixing tool (S26361-F3552-L909)

12.2.1.2 Preliminary steps

Before installing the TPM board, perform the following steps:

▶ Disable BitLocker functionality as described in section "Disabling BitLocker functionality" on page 59.

▶ Follow all procedures described in section "Opening the server" on page 48.

12.2.1.3   Installing the TPM board
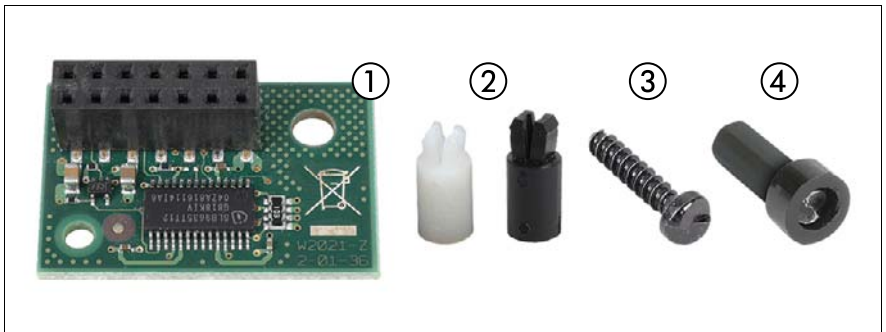
Figure 127: TPM kit

TPM kit (S26361-F3299-E2):

1   TPM module
        S26361-D2727-A10

2   TPM spacers

> **i**   Use the white TPM spacer (A3C40106008).
>   The black TPM spacer is not used in this server.

3   TPM special screw
        C26192-Y10-C176

4   TPM bit insert for TPM special screw
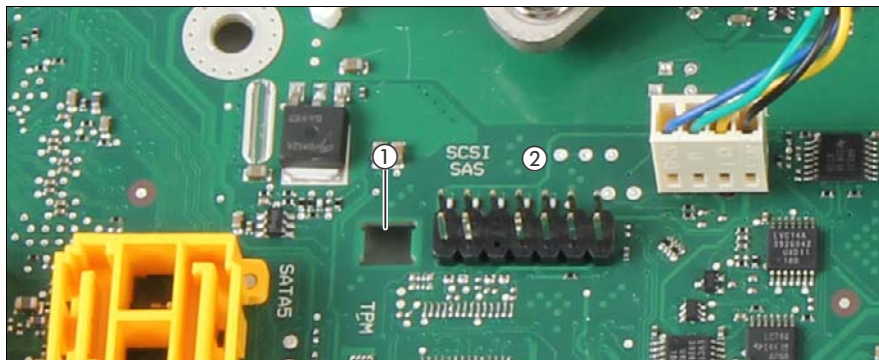
Figure 128: TPM mounting location (detail)

TPM mounting location on the system board:

1   Cut-out for TPM spacer
2   TPM connector
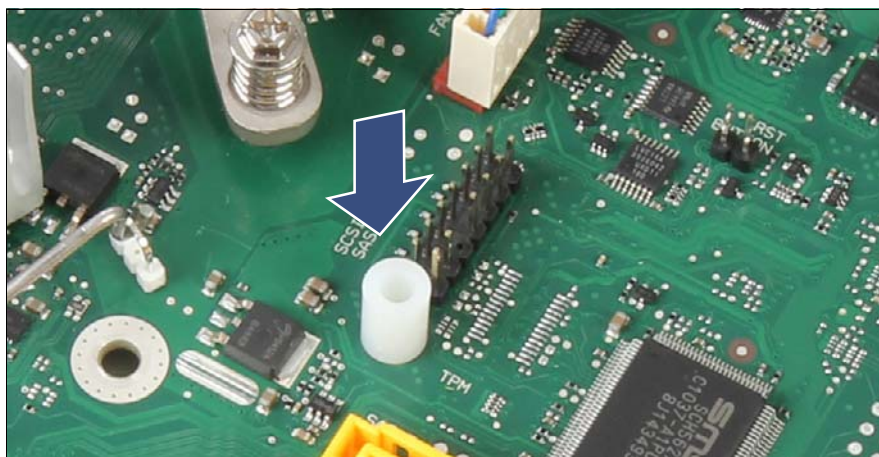
Figure 129: Installing the TPM spacer

► Snap the TPM spacer into the cut-out in the system board.
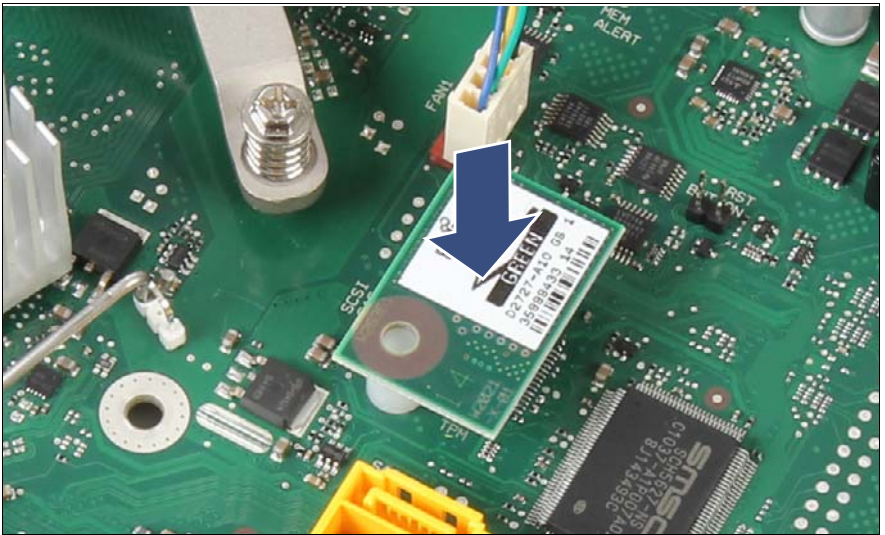
Figure 130: Installing the TPM board

► Connect the new TPM board to the system board.

Figure 131: TPM bit insert

► Attach the TPM bit insert or TPM module fixing tool (Japanese market) to a bit screw driver.

Figure 132: Securing the TPM board

► Secure the TPM board with the TPM special screw using the TPM bit insert.

> **i** Do not fasten the screw too firmly. Stop as soon as the head of the screw lightly touches the TPM board.

12.2.1.4 Concluding steps

Perform the following procedures to complete the task:

► Follow all procedures described in section "Closing the server" on page 54.

► Enable TPM in the system board BIOS. Proceed as follows:

  ► Switch on or restart your server.

  ► As soon as the startup screen appears, press the F2 function key to enter the BIOS.

  ► Select the *Advanced* menu.

  ► Select the *Trusted Computing* submenu.

  ► Set the *TPM Support* and *TPM State* settings to *Enabled*.

  ► Under *Pending TPM operation*, select the desired TPM operation mode.

  ► Save your changes and exit the BIOS.

i For detailed information on how to access the BIOS and modify settings, refer to the "Description - BIOS Manual D3090 / D3091" available online at *http://manuals.ts.fujitsu.com* or from the ServerView Suite DVD 2 supplied with your PRIMERGY server.

► If BitLocker functionality is used and has been disabled before starting the maintenance task, re-enable BitLocker as described in section "Enabling BitLocker functionality" on page 66.

12.2.2 Removing the TPM board

Field Replaceable Units (FRU)

Average task duration: 30 minutes

⚠ CAUTION!

Advise your contact persons that they must provide you with TPM backup copies. For security reasons, the TPM must be restored/re-saved by the customer. After installing a new system board, the TPM must be enabled. You may not clear the TPM data.

If the contact persons **DO NOT** have a backup copy available, inform them that replacing the TPM board will cause to lose all data.

12.2.2.1 Required tools

● Preliminary and concluding steps: tool-less

● Removing the system board:

– Phillips PH2 / (+) No. 2 screw driver

● Removing the TPM:

– thin slotted screw driver (2 x 0.4 mm)

For the Japanese market:

– Dedicated TPM screw driver (CWZ8291A)

12.2.2.2 Preliminary steps

Before removing the TPM board, perform the following steps:

► Before removing the TPM board, it is necessary to remove BitLocker-protection from the computer and to decrypt the volume.

Ask the system administrator to turn off BitLocker-protection using the BitLocker setup wizard available either from the Control Panel or Windows Explorer:

► Open Bitlocker Drive Encryption by clicking the *Start* button, clicking *Control Panel*, clicking *Security*, and then clicking *Bitlocker Drive Encryption*.

> **i** Administrator permission required If you are prompted for an administrator password or confirmation, type the password or provide confirmation.

► To turn off BitLocker and decrypt the volume, click *Turn Off BitLocker*, and then click *Decrypt the volume*.

> **i** Decrypting the volume may be time-consuming. By decrypting the volume, all of the information stored on that computer is decrypted.
>
> For further information on how to disable BitLocker drive encryption, please refer to the Microsoft Knowledge Base.
>
> Fujitsu service partners will find additional information (also available in Japanese) on the Fujitsu Extranet web pages.

► Disable TPM in the system board BIOS. Proceed as follows:

► Switch on or restart your server.

► As soon as the startup screen appears, press the F2 function key to enter the BIOS.

► Select the *Advanced* menu.

► Select the *Trusted Computing* submenu.

► Set the *TPM Support* and *TPM State* settings to *Disabled*.

► Save your changes and exit the BIOS.

> **i** For detailed information on how to access the BIOS and modify settings, refer to the "Description - BIOS Manual D3090 / D3091" available online at *http://manuals.ts.fujitsu.com* or from the ServerView Suite DVD 2 supplied with your PRIMERGY server.

► Follow all procedures described in section "Opening the server" on page 48.

12.2.2.3 Removing the TPM board

► Remove the system board as described in section "Removing the system board" on page 215.

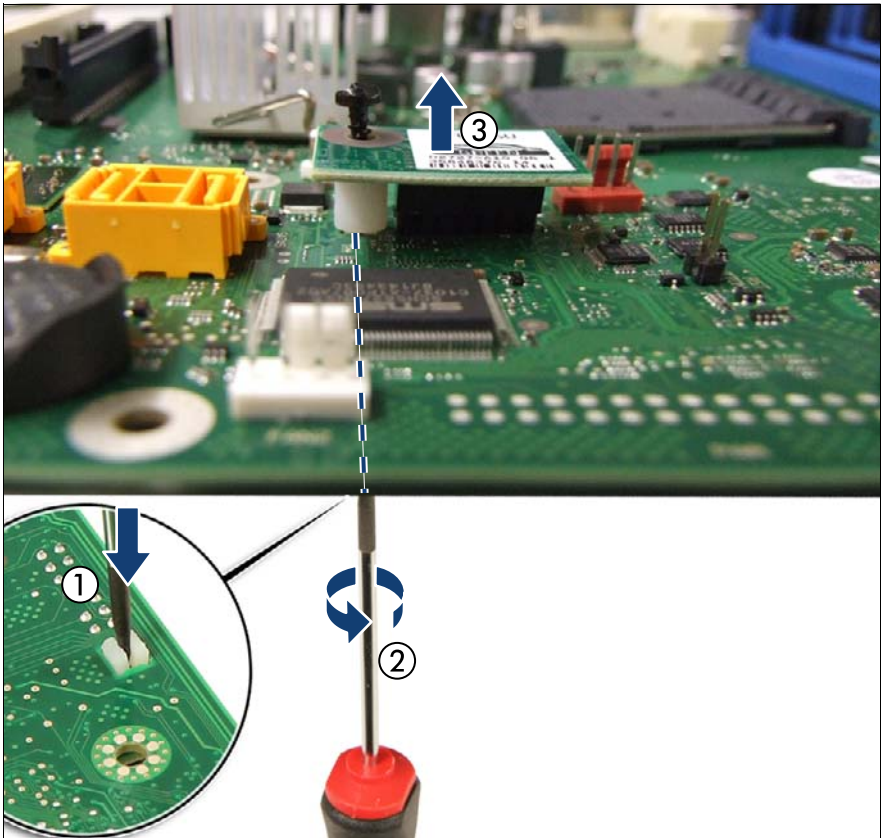► Lay the system board on a soft, antistatic surface with its component side facing down.

Figure 133: Removing the TPM screw

► Locate the slotted lower end of the TPM screw (1).

► Carefully loosen the TPM screw using a thin slotted screw driver (e.g. watchmaker's screw driver) or the dedicated TPM screw driver (Japanese market) (2).

⚠️ **CAUTION!**

Ensure to turn the screw in the direction of the arrow in order to remove it!

Slowly and carefully increase the pressure on the screw until it begins to turn. The effort when loosing the screw should be as low as possible.

Otherwise the thin metal bar may break, rendering it impossible to loosen the screw.

► Remove the TPM screw (3).

► Remove the defective TPM board on the upper side of the system board.
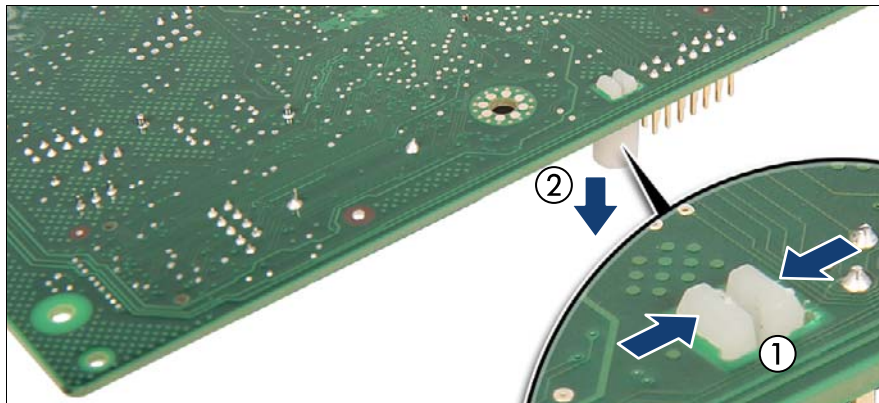
Figure 134: Removing the TPM spacer

► Using a small pair of combination pliers, press together the hooks on the TPM spacer (1, see circle) and remove it from the system board (2).

ℹ️ If the TPM module is to be replaced, the TPM spacer may remain on the system board.

12.2.2.4 Concluding steps

Perform the following procedures to complete the task:

► Follow all procedures described in section "Closing the server" on page 54.

12.3   Replacing the system board

Field Replaceable Units (FRU)

Average hardware task duration: 50 minutes

Average software task duration: 10 minutes

12.3.1 Required tools

Note on TPM

The system board can be equipped with an optional TPM (Trusted Platform Module). This module enables third party programs to store key information (e. g. drive encryption using Windows Bitlocker Drive Encryption).

If the customer is using TPM functionality, the TPM has to be removed from the defective system board and connected to the new system board. For a detailed description, please refer to section "Trusted Platform Module (TPM)" on page 204.

The TPM is activated in the system BIOS.

CAUTION!

– Before replacing the system board, ask the customer whether TPM functionality is used.

– If the customer is using TPM functionality, remove the TPM from the old system board and install it on the new system board.

   Advise your contact persons that they must provide you with TPM backup copies. For security reasons, the TPM must be restored / re-saved by the customer. After installing a new system board the TPM must be enabled. You may not clear the TPM data.

   If the contact persons **DO NOT** have a backup copy available, inform them that replacing the TPM board will cause to lose all data.

● Preliminary and concluding steps: tool-less

● Replacing the system board:

– Phillips PH2 / (+) No. 2 screw driver

● Replacing the system board:

– Magnifying glass (for inspecting socket cover springs)

If a TPM module is installed:

– Bit screw driver
– TPM bit insert*
– thin slotted screw driver (2 x 0.4 mm)*

*For the Japanese market:

– Dedicated TPM screw driver (CWZ8291A)
– TPM module fixing tool (S26361-F3552-L909)

12.3.2 Preliminary steps

Before replacing the system board, perform the following steps:

► Disable BitLocker functionality as described in section "Disabling BitLocker functionality" on page 59.

► Shut down the server as described in section "Shutting down the server" on page 48.

► Disconnect all external cables.

► Bring the server to its horizontal position.

► Remove the server cover as described in section "Removing the server cover" on page 51.

► Fold open the front cage.

12.3.3 Removing the system board

► Remove all cables from the system board.

► Remove the following components from the system board as shown in the related sections:

– Memory modules: refer to section "Removing memory modules" on page 184

> **i** Ensure to take note of the memory modules' mounting positions for reassembly.

– Expansion cards: refer to the section "Removing expansion cards" on page 165

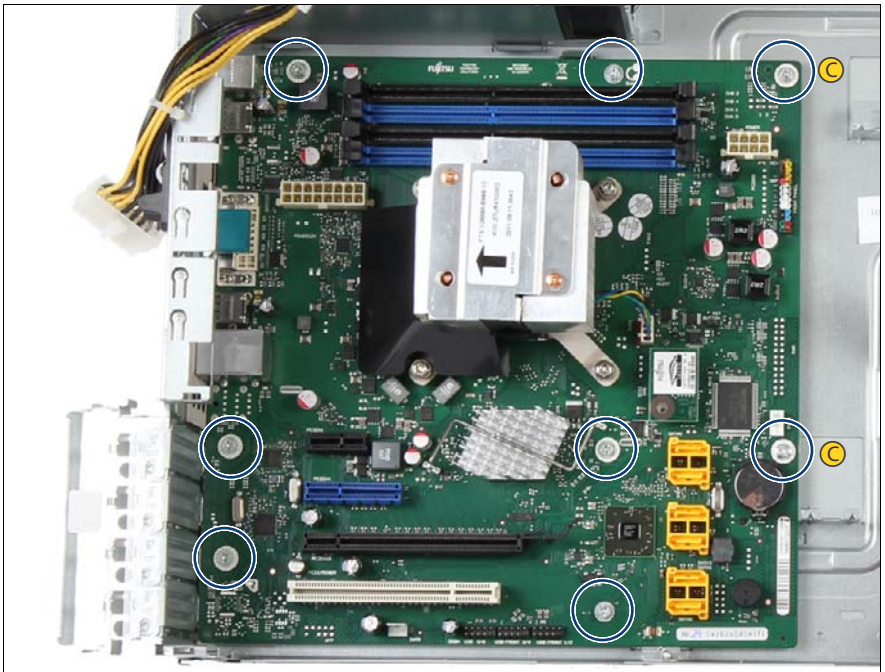> **i** Ensure to take note of the controllers' mounting positions and cable connections for reassembly.

Figure 135: Detaching the system board (A)

► Remove eight screws from the system board (see circles) beginning with the two centering bolts (C).
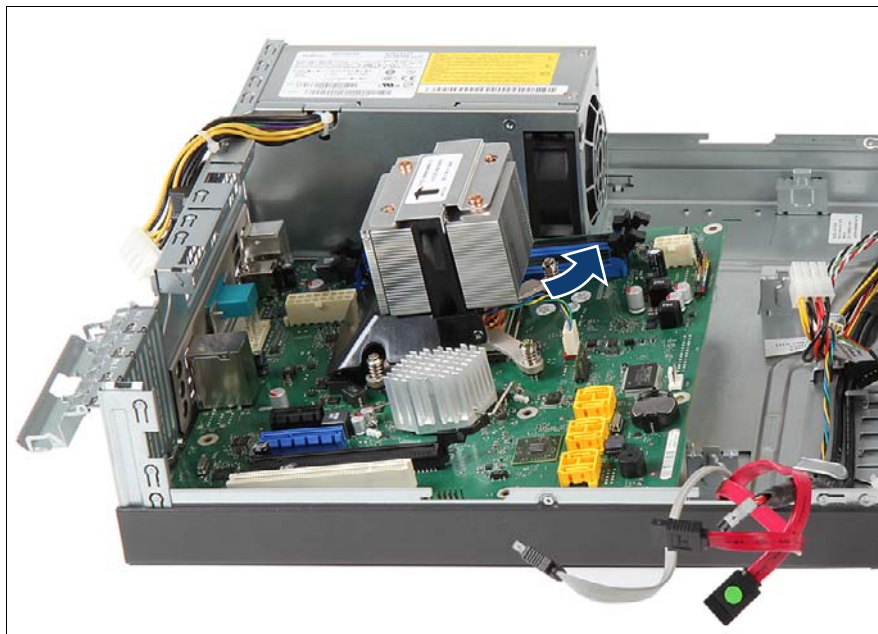

Figure 136: Detaching the system board (B)

⚠ **CAUTION!**

– Do not lift or handle the system board by any of its heat sinks!

– Ensure not to damage the EMI springs to comply with applicable EMC regulations and satisfy cooling requirements and fire protection measures.

► Hold the defective system board by the memory module ejectors and a PCI slot and shift the system board to the right until the plug shells disengage from the cut-outs in the connector panel and lift it out of the chassis.

► If applicable, remove the TPM board as described in section "Trusted Platform Module (TPM)" on page 204.

► Remove the processor heat sink and the processor as described in section "Replacing the processor" on page 191.

Figure 137: Removing the heat sink counter plate

► Remove heat sink counter plate from the bottom side of the system board.

12.3.4   Installing the system board
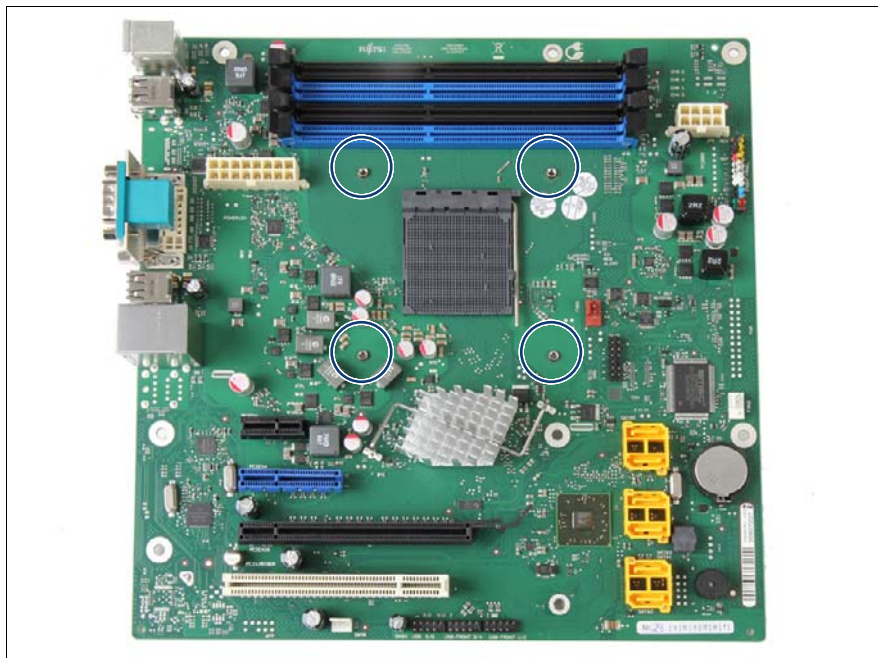
12.3.4.1   Mounting the system board

Figure 138: Inserting the heat sink counter plate

► Insert the heat sink counter plate from the bottom to the system board. The bolts must come through the system board (see circles).

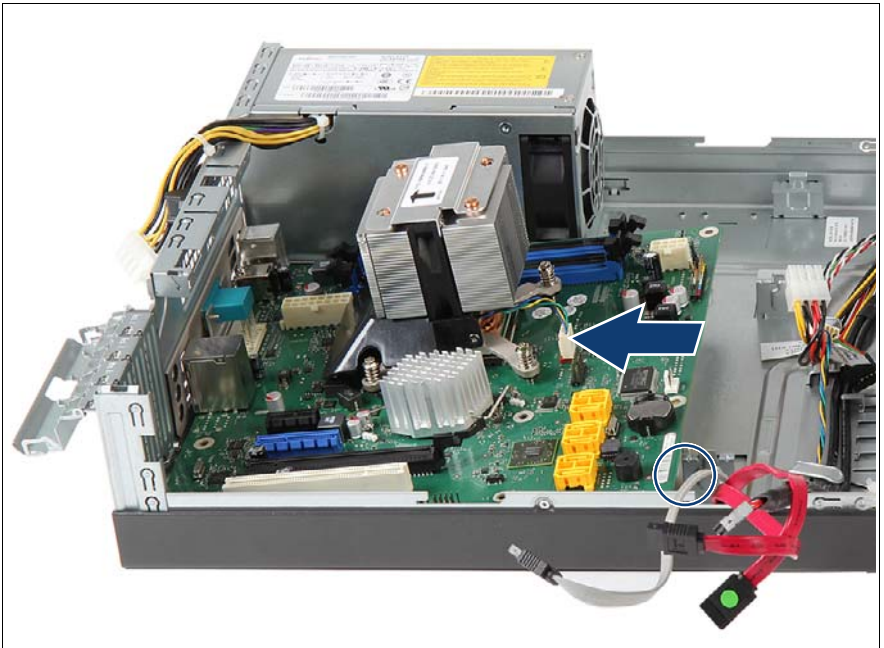► Install the processor and the heat sink as described in section "Replacing the processor" on page 191.

Figure 139: Installing the system board (A)

► Hold the new system board by the memory module ejectors and a PCI slot.

⚠ **CAUTION!**

– Do not lift or handle the system board by any of its heat sinks!

– Ensure not to damage the EMI springs to comply with applicable EMC regulations and satisfy cooling requirements and fire protection measures.

– Ensure that the system board is not scratched by the metal stop angle (see circle).

► At a slight angle, lower the system board into the chassis.

► Carefully shift the system board towards the server rear until the plug shells engage with the cut-outs in the connector panel.

► Lower the system board.

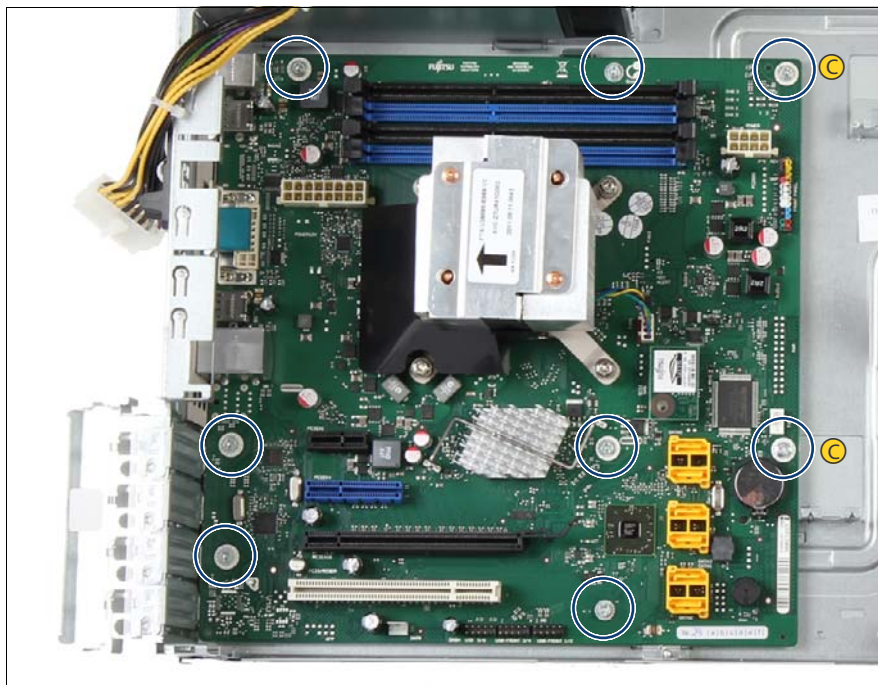Figure 140: Installing the system board (B)

▶ Secure the system board with eight screws (M3 x 4.5 mm, standard C67 screw) (see circles) beginning with the two centering bolts (C).

> **i** Screw torque: 0.6 Nm (not applicable for the Japanese market)

▶ Verify the settings on the new system board (DIP switches, jumpers). For a detailed description, please refer to section "Onboard settings" on page 250.

12.3.5 Concluding steps

▶ Reconnect all cables to the system board. For a complete cabling overview, please refer to section "Cabling" on page 235.

▶ Reinstall all remaining system board components as shown in the related sections:

– Memory modules: refer to section "Installing a memory module" on page 182

i Install all memory modules into their original slots.

– Expansion cards: refer to section "Installing expansion cards" on page 161

i Install all expansion cards into their original slots.

– TPM board (if applicable): refer to section "Installing the TPM board" on page 204

▶ Follow all procedures described in section "Closing the server" on page 54.

▶ Reconnect all external cables.

▶ If applicable, activate TPM functionality in the system BIOS under *Advanced* > *Trusted Computing*. For more information, refer to the "Description - BIOS Manual D3090 / D3091".

▶ If available, update the system board BIOS to the latest version as described in section "Updating the system board BIOS" on page 62.

▶ Inform the customer about changed MAC addresses. For further information, refer to section "Looking up changed MAC addresses" on page 67.

▶ If BitLocker functionality is used and has been disabled before starting the maintenance task, re-enable BitLocker as described in section "Enabling BitLocker functionality" on page 66.

▶ Enter the required system information using the ChassisId_Prom Tool as described in section "Using the Chassis ID Prom Tool" on page 68.

13   Front panel and front USB

Safety notes

⚠ **CAUTION!**

- When inserting the front panel module into the server, ensure not to pinch or strain any connected cables.

- Circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. Always discharge static build-up (e.g. by touching a grounded object) before handling electrostatic-sensitive devices (ESDs)

- Do not touch the circuitry on boards or soldered parts. Hold circuit boards by their metallic areas or edges.

- For further information, please refer to chapter "Important information" on page 31.

In this chapter

- "Replacing the front panel indicators" on page 224

- "Replacing the front USB board" on page 229

13.1 Replacing the front panel indicators

The On/Off button and the HDD activity LED are part of the front panel module.

Field Replaceable Units (FRU)

Average task duration: 15 minutes

13.1.1 Required tools

● Preliminary and concluding steps: tool-less

● Replacing the front panel module: tool-less

13.1.2 Preliminary steps

► Follow all procedures described in section "Opening the server" on page 48.

► Open the front cage as described in section "Opening the front cage" on page 52.

13.1.3   Removing the On/Off button

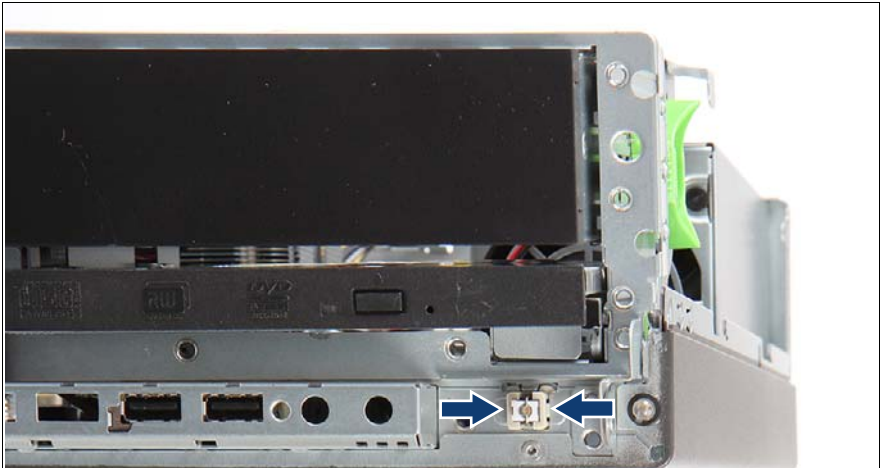Figure 141: Removing the On/Off button

► Press the two retaining clips together and push the On/Off button backwards in the chassis.

> **i** Note the orientation of the On/Off button. If it is installed in the other direction, it does not work properly.

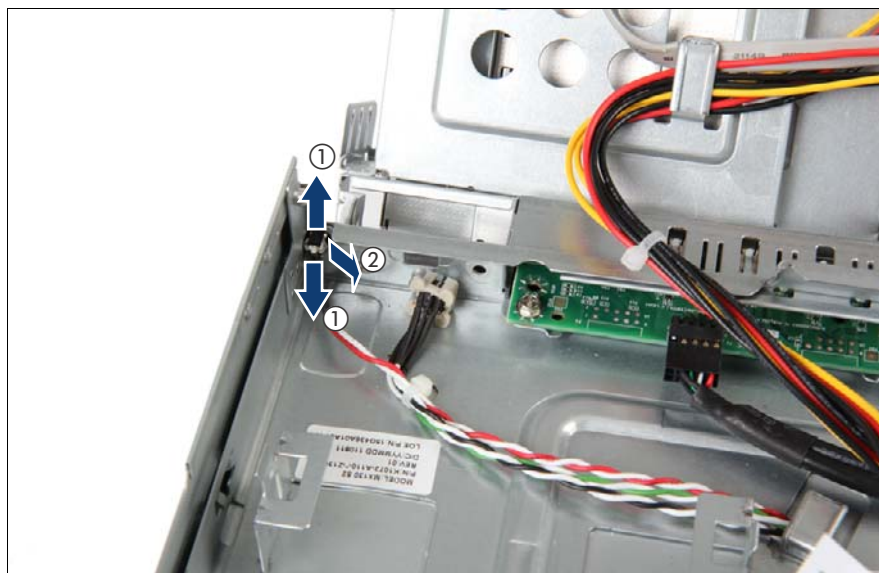## 13.1.4 Removing the HDD activity LED

Figure 142: Removing the HDD activity LED

► Push apart the two latches (1) and pull the LED to the direction of the arrow (2).

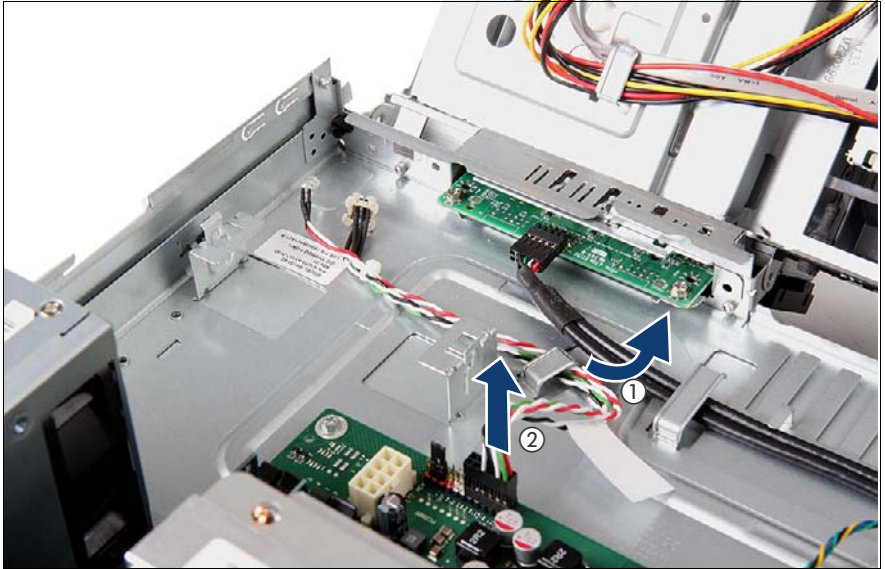## 13.1.5 Removing the cable for On/Off button and HDD activity LED

Figure 143: Disconnecting front panel cable

► Remove the cable from the cable holder(1).

► Disconnect the cable from system board connector Front panel (2).

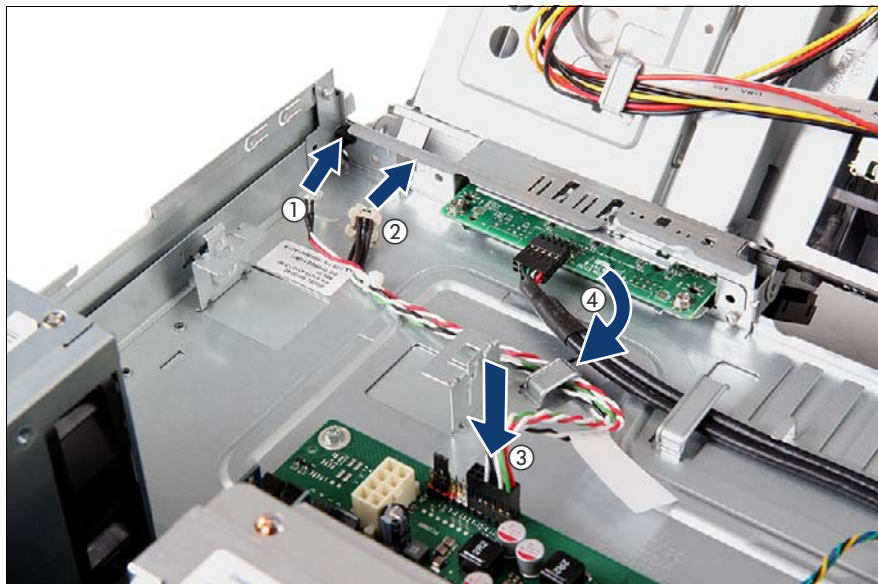## 13.1.6 Installing the On/Off button and the HDD activity LED

Figure 144: Installing the On/Off button and HDD activity LED

► Insert the HDD activity LED in the direction shown until it snaps in place (1).

► Insert the On/Off button in the direction shown until it snaps in place (2).

> **i** Take care of the orientation of the On/Off button. If it is installed in the other direction, it does not work properly.

► Connect the front panel cable to the system board connector Frontpanel (3).

► Route the cable through the cable holder (4).

13.1.7 Concluding steps

► Close the front cage as described in section "Closing the front cage" on page 53.

► Follow all procedures described in section "Closing the server" on page 54.

13.2 Replacing the front USB board

Field Replaceable Units (FRU)

Average task duration: 15 minutes

13.2.1 Required tools

● Preliminary and concluding steps: tool-less
● Replacing the front panel module:
    – Phillips PH2 / (+) No. 2 screw driver

13.2.2 Preliminary steps

► Follow all procedures described in section "Opening the server" on page 48.
► Open the front cage as described in section "Opening the front cage" on page 52.

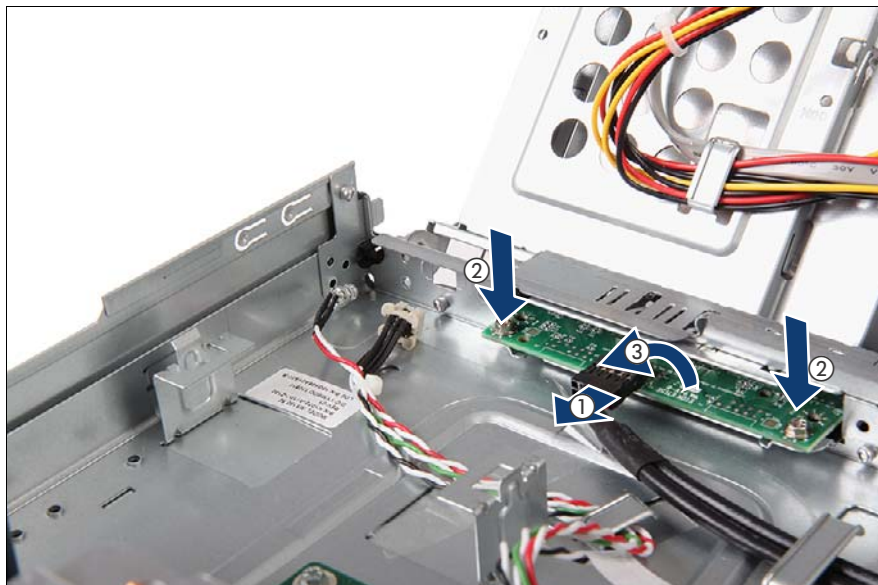## 13.2.3   Removing the defective front USB board

Figure 145: Disconnecting the USB front cable, removing the front USB board

► Disconnect the front USB cable from the front USB board (1).

► Remove the two screws of the front USB board (2).

► Remove the front USB board (3).

13.2.4 Installing the new front USB board

Figure 146: Installing the front USB board
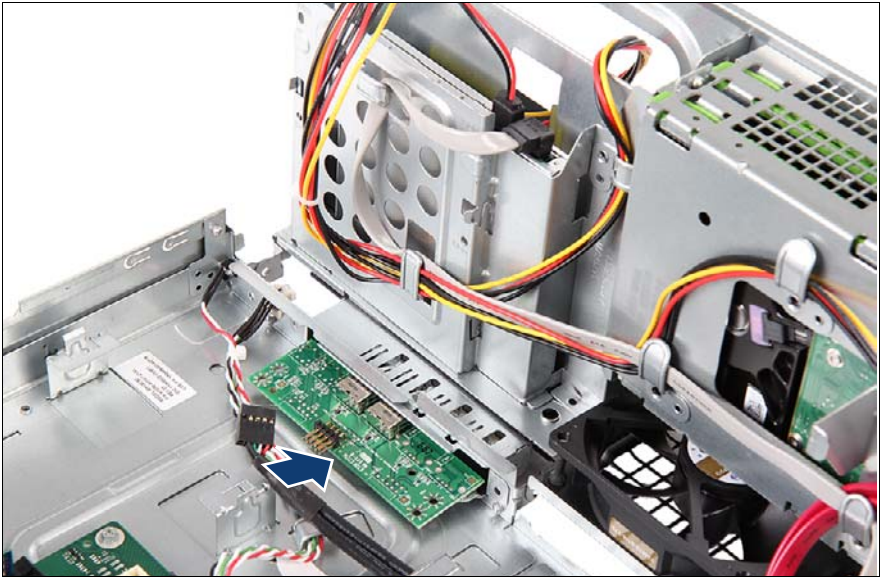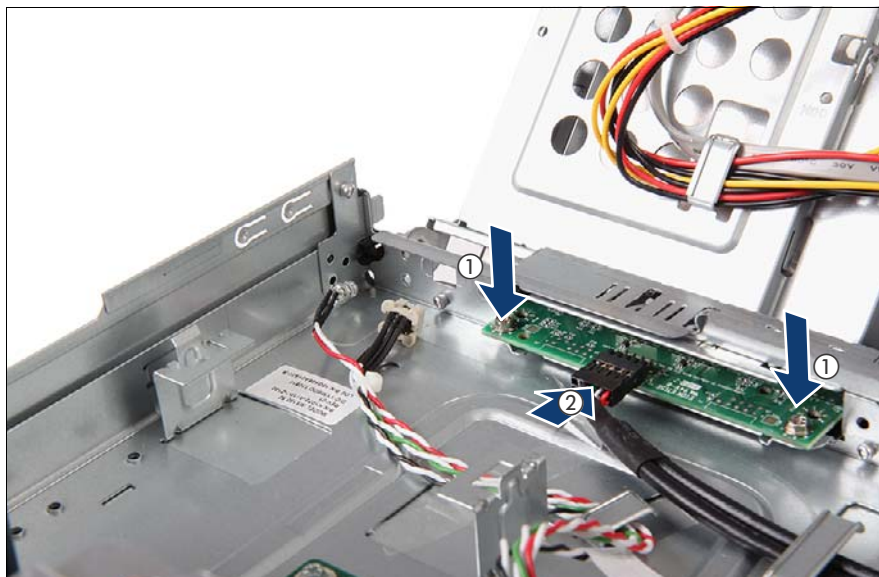
► Insert the new front USB board.

Figure 147: Connecting the USB front cable

► Secure the new front USB board with two screws (1)

► Connect the front USB cable to the front USB board (2).

13.2.5 Concluding steps

► Close the front cage as described in section "Closing the front cage" on page 53.

► Follow all procedures described in section "Closing the server" on page 54.

14   Cables

Safety notes

⚠ **CAUTION!**

● Always hold cables by their connectors when disconnecting them. Never pull on the cable to disconnect cables.

● Ensure that none of the cables are scraped, strained or otherwise damaged while replacing system components.

● Immediately replace cables with damaged shielding.

● Always use shielded network cables.

In this chapter

● "Cabling overview" on page 234

● "Cabling" on page 235

● "Replacing the power cable" on page 239

14.1 Cabling overview

14.1.1 Overview of used cables

#	Name	Number	Routing
1	Front panel connector cable	T26139-Y4001-V211	from front LEDs to system board
2	Front USB cable	T26139-Y4018-V1	from front USB board to connector USB-FRONT 1/2
3	Power cable	T26139-Y4012-V211	from all drives to system board
4	ODD SATA cable (1x straight plug, 1x angled plug)	T26139-Y4028-V102	from ODD to system board
5	ODD SATA cable (2x straight plugs)	T26139-Y4028-V201	from slimline ODD in 5.25-inch bracket C26361-K655-B42 to system board
6	HDD SATA cable	T26139-Y4028-V153	from 3.5-inch HDD drive to system board
7	RDX-Drive Power Adapter	SNP:A3C40057660	from RDX-Drive to power cable SATA
8	USB cable	T26139-Y3973-V401	from USB backup drive to system board
9	USB cable	T26139-Y3893-V301	USB cable from Dash LAN board to connector DASH USB 5/6
10	eSATA cable (optional for specific markets)	T26139-Y3983-V1	free slot in the chassis to connector SATA6

Table 6: List of used cables

14.2 Cabling

14.2.1 Power cabling
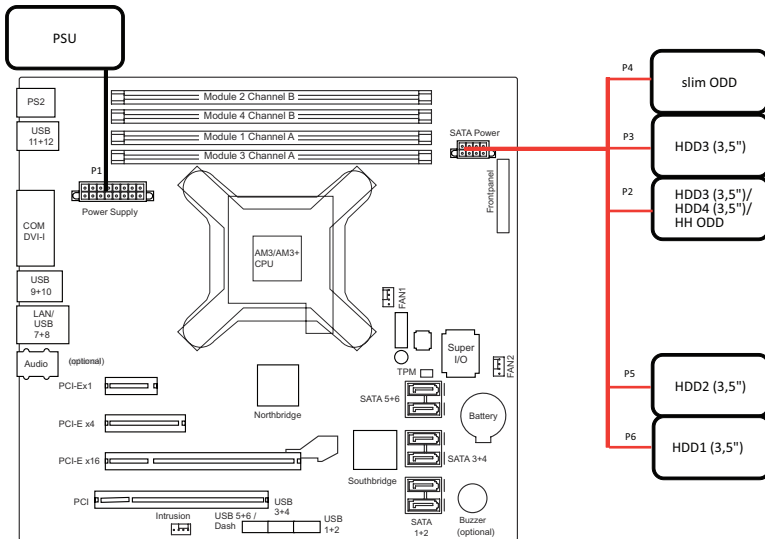
Standard configuration

Figure 148: Power cabling

Configuration with RDX

Figure 149: Power cabling - RDX drive

14.2.2 Data cabling
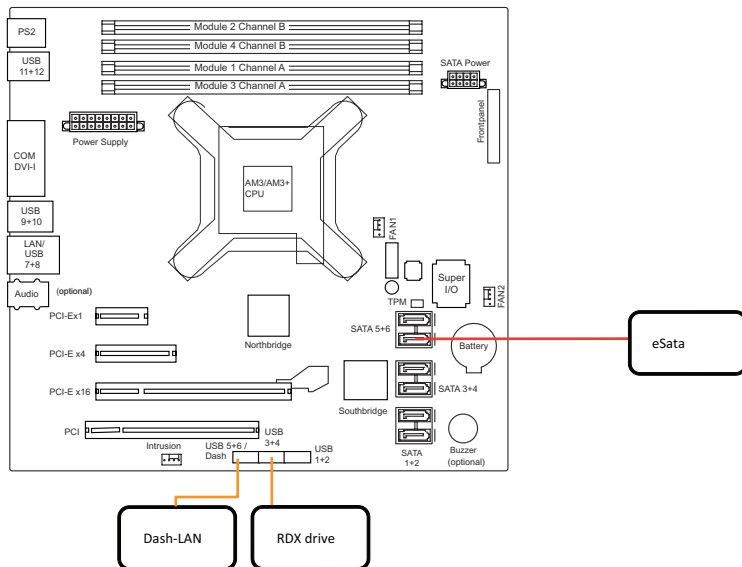
Data cabling fixed positions

Figure 150: Data cabling for RDX, eSata and Dash LAN

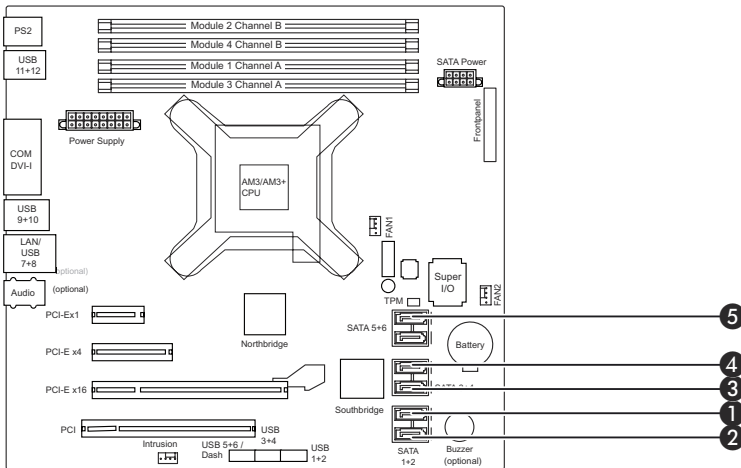## Data cabling variable positions depending on the drive configuration

Figure 151: Data cabling with slim ODD via chassis-adapter

SATA-Port	HDD1	HDD2	HDD3	HDD4	slim ODD	slim ODD	HH ODD
	T26139-Y4028-V153	T26139-Y4028-V153	T26139-Y4028-V153	T26139-Y4028-V153	T26139-Y4028-V201	T26139-Y4028-V102	T26139-Y4028-V102
	HDD to system board	HDD to system board	HDD to system board	HDD to system board	slim ODD in 5.2inch bracket to SB	slim ODD in chassis bay to SB	HH ODD to system board
1xHDD	1						
2xHDD	1	2					
3xHDD	1	2	3				
4xHDD	1	2	3	4			
1xHDD +1xODD	1				2	2	2
2xHDD +1xODD	1	2			3	3	3
3xHDD +1xODD	1	2	3		4	4	4
4xHDD +1xODD	1	2	3	4	5		

14.3 Replacing the power cable

Field Replaceable Units (FRU)
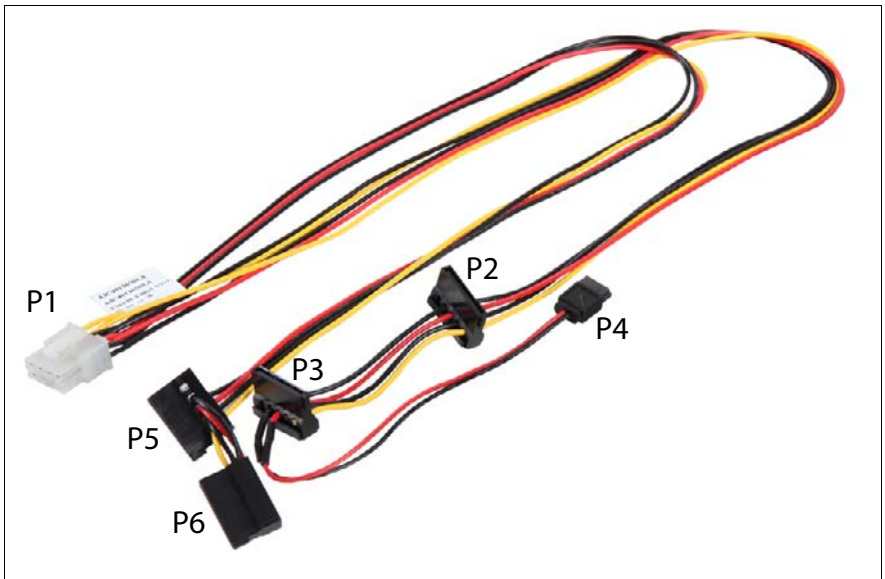
Average task duration: 10 minutes

Figure 152: Power cable T26139-Y4012-V211

14.3.1 Required tools

● Preliminary and concluding steps: tool-less

● Replacing the power cable: tool-less

14.3.2 Preliminary steps

Before replacing the power cable, perform the following steps:

► Follow all procedures described in section "Opening the server" on page 48.
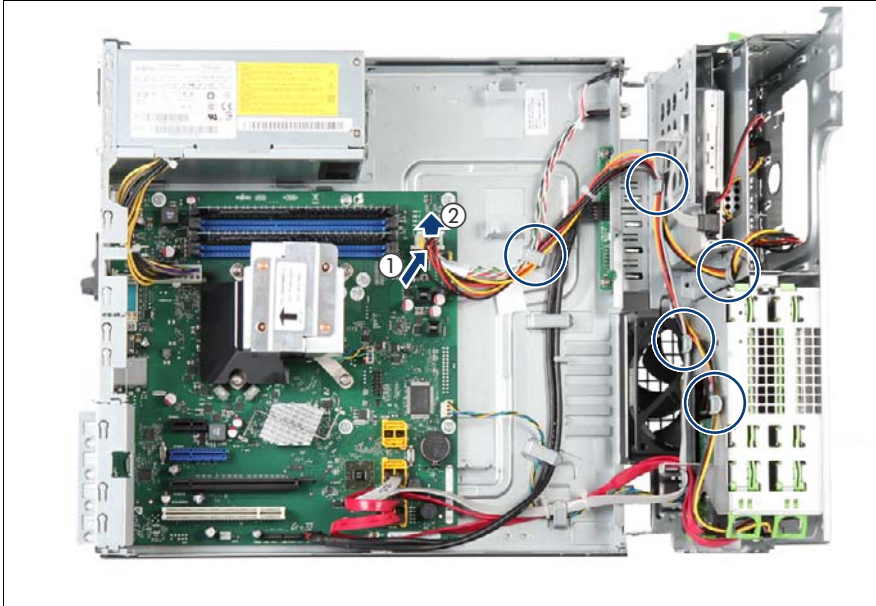
14.3.3 Removing the power cable

Figure 153: Detaching the power cable

► While pressing the release latch on the connector (1), disconnect the power cable from the POWER SATA connector on the system board (2).

► Remove the power cable T26139-Y4012-V211 from the five cable clamps (see circles).

Figure 154: Disconnecting the power cable from installed drives

► Disconnect all power cable connectors from the installed drives (1).

It depends on your configuration which drives are installed. For details refer to section "HDDs and accessible drives" on page 79.

► Disconnect the power cable connectors P5 and P6 from the installed HDDs (2).

For details refer to "Replacing the power cable" on page 239.

► Remove the power cable from the chassis.

14.3.4 Installing the power cable

Figure 155: Connecting the power cable to the system board

▶ Connect the new power cable to system board connector
  POWER SATA (1).

▶ Run the power cable through the five cable clamps (see circles).
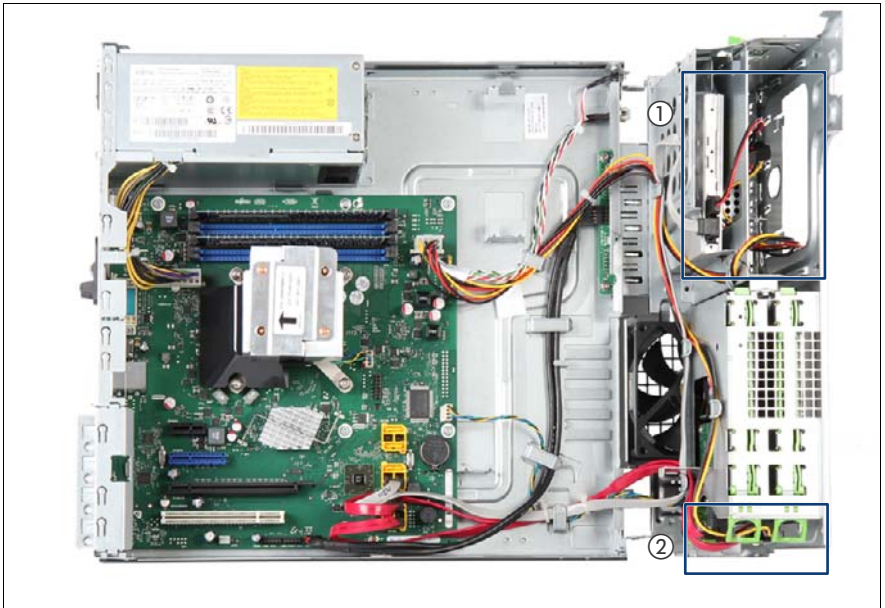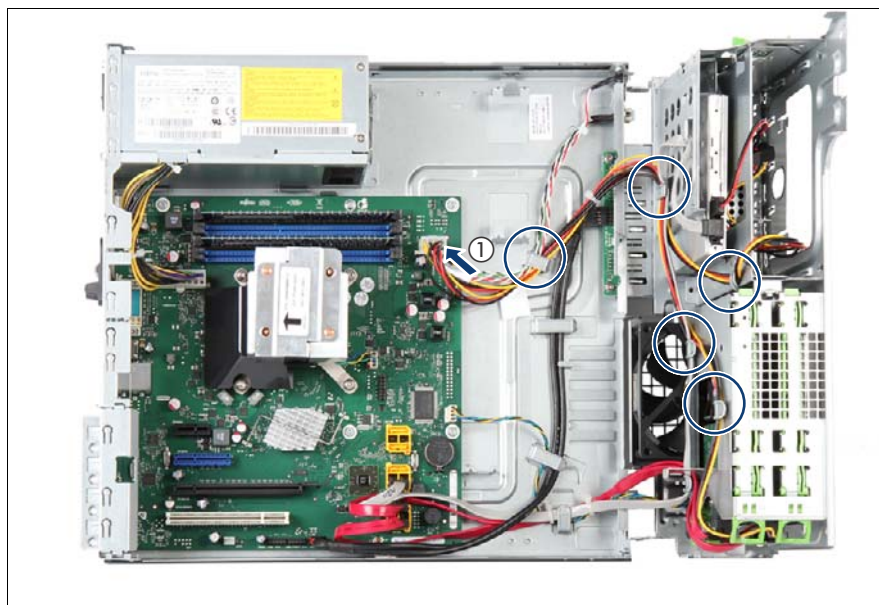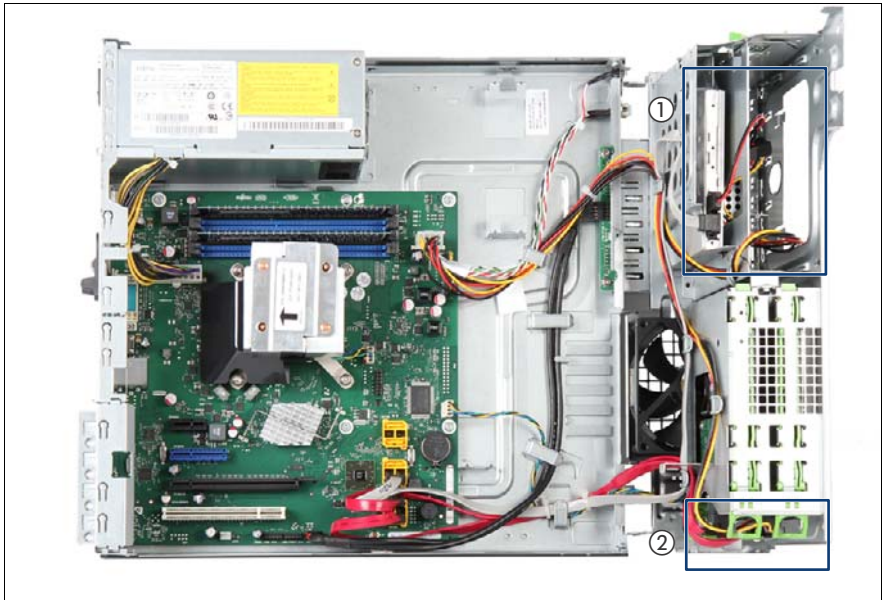
Figure 156: Connecting the power cable

► Connect all power cable connectors to the installed drives (1).

It depends on your configuration which drives are installed. For details refer to section "HDDs and accessible drives" on page 79.

► Connect the power cable connectors P5 and P6 to the installed HDDs (2).

For details refer to section "HDDs and accessible drives" on page 79 and "Power cabling" on page 235.

14.3.5 Concluding steps

Perform the following procedures to complete the task:

► Follow all procedures described in section "Closing the server" on page 54.

15 Appendix

15.1 Mechanical overview

15.1.1 Server front
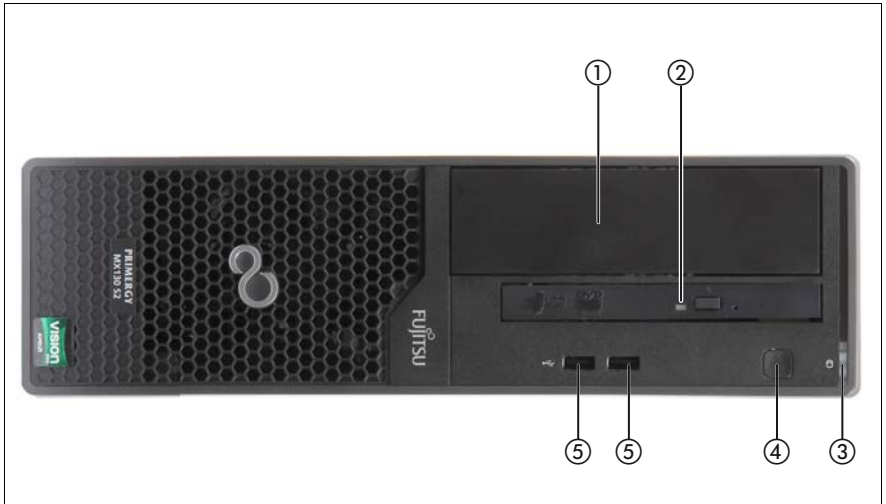
Figure 157: PRIMERGY MX130 S2 front

Pos.	Component
1	5.25-inch chassis bay
2	slimline ODD chassis bay
3	HDD activity indicator
4	Power-on indicator and On / Off button
5	Front USB connectors

15.1.2 Server rear
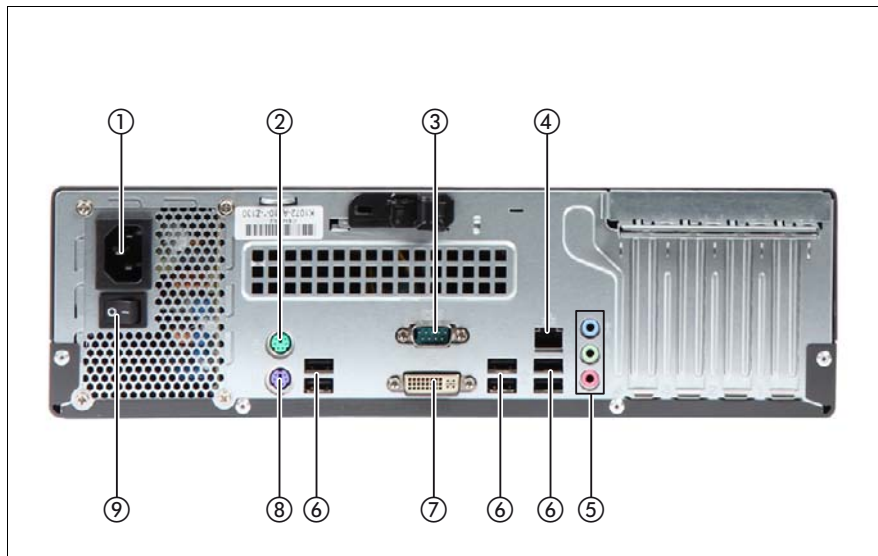
Figure 158: PRIMERGY MX130 S2 rear

Pos.	Component
1	Main power
2	PS2 connector (for mouse)
3	Serial connector (COM1)
4	Standard LAN connector
5	Audio connectors (optional for specific markets)
6	USB connectors 1-6
7	Video connector (DVI-I)
8	PS2 connector (for keyboard)
9	ON/OFF switch

15.1.3 Server interior
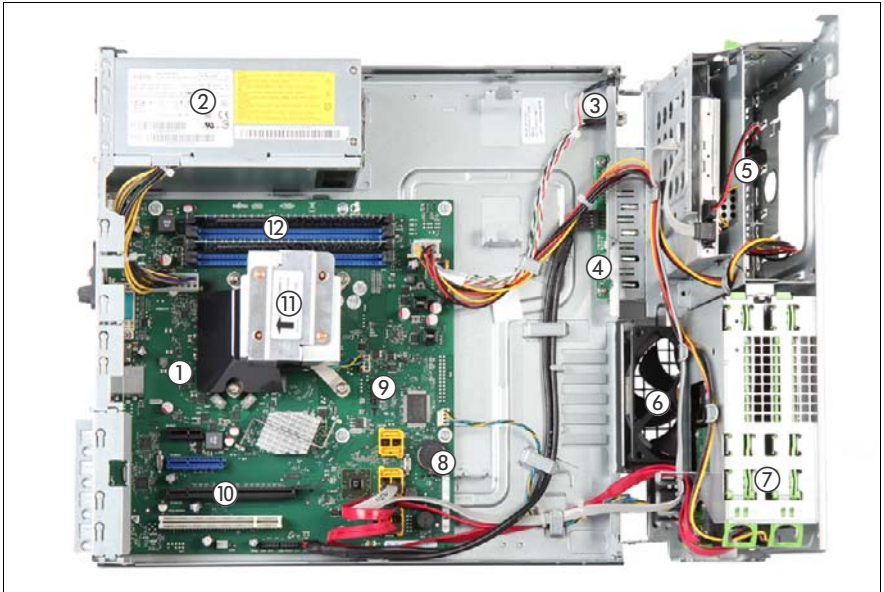
Figure 159: PRIMERGY MX130 S2 interior

Pos.	Component
1	System board D3090
2	Standard PSU
3	ON/OFF button, HDD activity indicator
4	Front USB
5	Drive bays
6	System fan
7	HDD drive bay
8	CMOS battery
9	TPM board
10	Expansion card slots
11	Processor / CPU heat sink
12	Memory modules

15.2 Configuration tables

15.2.1 Mounting order for HDDs

Please refer to chapter "HDDs and accessible drives" on page 79.

15.2.2 Memory board configuration

Please refer to chapter "Main memory" on page 179.

15.2.3 Expansion card configuration table

Please refer to chapter "Expansion cards" on page 159.

15.3 Connectors and indicators

15.3.1 Connectors and indicators on the system board

15.3.1.1 Onboard connectors
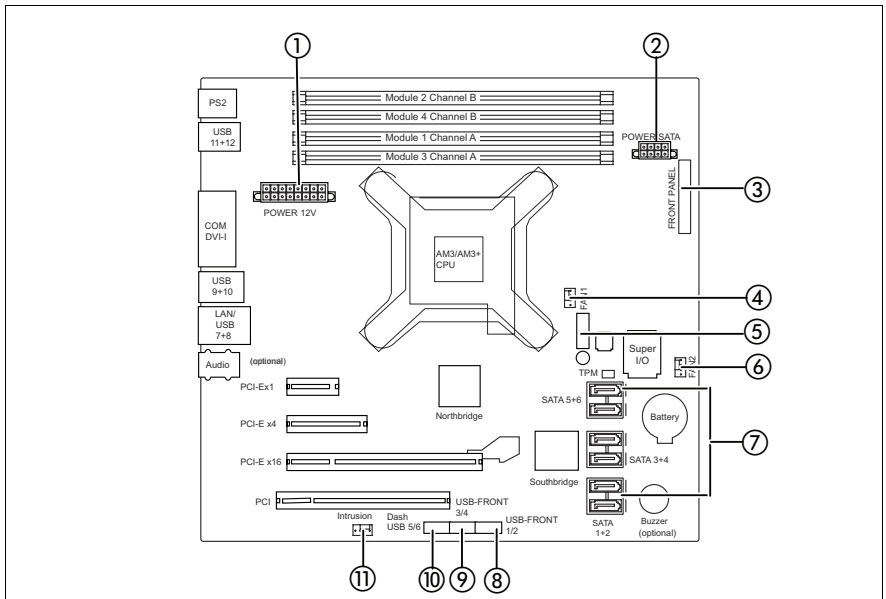
Figure 160: Internal connectors of the system board D3090

No.	Print	Description
1	POWER12V	ATX power supply connector
2	POWER SATA	Power distribution for HDDs and accessible drives
3	FRONT PANEL	Front panel
4	FAN1	CPU fan
5	TPM	Connector for Trusted Platform Module (TPM)
6	FAN2	System fan
7	SATA 1-6	SATA connectors drive configurations
8	USB-FRONT 1/2	USB connector for front USB board

No.	Print	Description
9	USB-FRONT 3/4	USB connector for accessible backup drive
10	Dash USB 5/6	USB connector for Dash LAN cable

15.3.1.2 Onboard settings
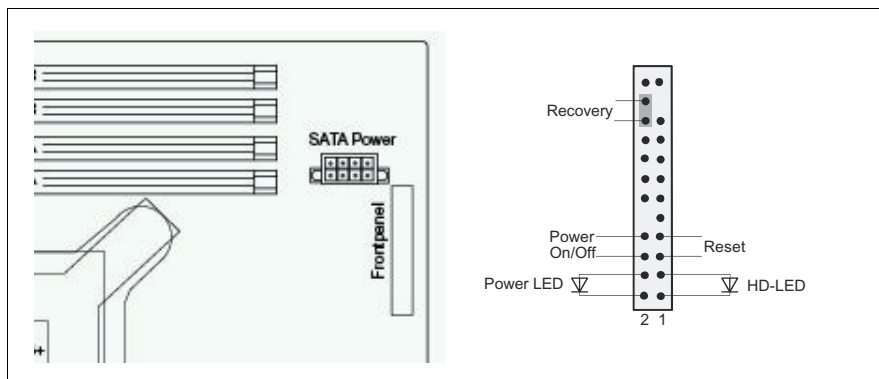
Figure 161: Jumper

Setting	Description
Default	Password skip disabled and recovery BIOS disabled.
RCV	Recovery BIOS enabled.
	When the recovery BIOS is applied on a system board, the password set by customers disappears from system board.
SKP	Password skip enabled.
	The password is deleted and the default BIOS settings are applied after "Password skip" jumper was set once.

15.3.1.3   I/O panel connectors
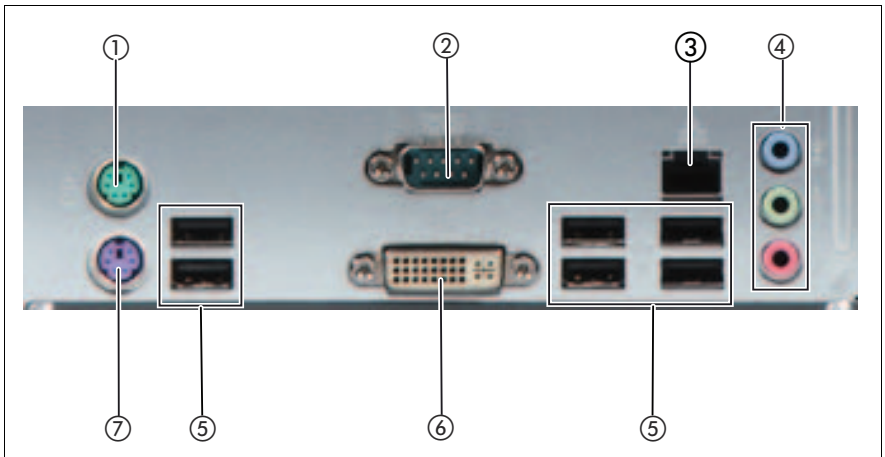
Figure 162: Connector panel on the rear side

1	PS2 connector (for mouse)
2	Serial connector (COM1)
3	Standard LAN connector
4	Audio connectors (optional for specific markets)
5	6 USB connectors
6	Video connector (DVI-I)
7	PS2 connector (for keyboard)

15.3.1.4   I/O panel indicators

Figure 163: Indicators on the connector panel: LAN indicators

Indicator		Status	Description
1	LAN link/transfer	green on	LAN connection established
		off	no LAN connection
		green flashing	data transfer in progress
2	LAN speed	yellow on	traffic a transfer rate of 1 Gbit/s
		green on	traffic a transfer rate of 100 Mbit/s
		off	traffic a transfer rate of 10 Mbit/s

> **i** **Note on the onboard LAN controller**
>
> The system board is equipped with a Gigabit Ethernet Controller that supports transfer rates of 10 Mbit/s, 100 Mbit/s and 1 Gbit/s.
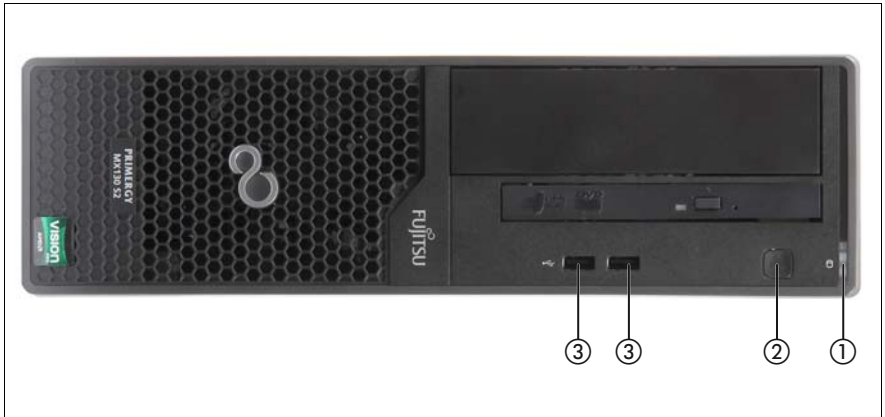
15.3.2 Connectors and indicators on the front panel

Figure 164: Front side (indicators and controls)

1	HDD activity indicator	3	2 USB connectors
2	On/Off button - Power-on indicator		

Status indicators

Pos.	Indicator	Status	Description
1	HDD activity indicator	green flashing	data access in progress
2	Power-on indicator	green on	server is switched on and running
		dark	server is switched off, but mains voltage is present (standby mode)

Buttons

Pos.	Button	Function
2	On / Off button	This button is used to switch the server on or off.
		i If the system is running an ACPI-compliant operating system, the pressing the On / Off button will performs a graceful shutdown.
		Pressing and holding the On / Off button for five seconds will switches the server off without shutting down the operating system.

15.4   Minimum startup configuration

Field Replaceable Units (FRU)

If the server does not start up or other problems occur, it may be necessary to take the system down to its most basic configuration in order to isolate the defective component.

The minimum startup configuration consists of the following components and cables:

Component	Notes
System board	no TPM or expansion cards installed
CPU with CPU heat sink	
1 memory module	installed in slot 1
PSU	

Table 7: Minimum startup configuration - components

Cable	Notes and reference
Front panel cable	
Power cable	see section "Replacing the power cable" on page 239

Table 8: Minimum startup configuration - cables

► Follow all procedures described in section "Opening the server" on page 48.

► Take the system down to its minimum startup configuration.

► Connect a keyboard, mouse and display to the server.

► Follow all procedures described in section "Closing the server" on page 54.

⚠ **CAUTION!**

Since the system fan is not included in the minimum startup configuration, the server must be shut down immediately after the diagnostic process is complete (POST phase has been passed).

The minimum startup configuration must be used exclusively for diagnostic purposes by maintenance personnel, never in daily operation!

Appendix